Second Five Year Review Report
For
Saco Municipal Landfill Superfund Site
Saco, Maine

September 2010

Prepared By:

United States Environmental Protection Agency
EPA New England
Boston, Massachusetts

Approved by: **Date:**

9/9/10

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EPA New England

Table of Contents
Second Five-Year Review Report
Saco Municipal Landfill Superfund Site

ATTACHMENTS

Figures
Tables
Appendices

2010 Site Inspection Report, Nobis Engineering, July 12, 2010

EPA Inspection//Interview List, June 9, 2010

July 2010 Evaluation of Potential Health Risks Associated with Wading in Sandy Brook, Saco Municipal Landfill, Woodard and Curran

August 5, 2010 Technical Memorandum, Cornell Rosiu, Protectiveness of the Environment Statement, Saco Municipal Landfill Superfund Site

References

United States Environmental Protection Agency (USEPA) 2000. Record of Decision Summary, Saco Municipal Landfill Superfund Site, Saco, Maine, September 29, 2000.

Woodard and Curran, 2009 Annual Long-Term Monitoring and Second Five-Year Review Report, June 2010

US EPA, First Five Year Review Report, September 2005

Executive Summary

The cleanup actions at the Saco Municipal Landfill Superfund Site in Saco, Maine included the placement of a cap over the landfill, installation of passive gas venting wells, and monitored natural attenuation of the contaminated groundwater. The Site achieved construction completion in March 2005.

This five-year review documents that the cleanup actions remain protective of public health and the environment. The immediate threats at the Site have been addressed and the remedy will achieve long-term protection when groundwater cleanup goals are met.

Five-Year Review Summary Form

FIVE-YEAR REVIEW SUMMARY FORM			
SITE IDENTIFICATION			
Site name *(from WasteLAN)*: Saco Municipal Landfill Superfund Site			
EPA ID *(from WasteLAN)*: MED980504393			
Region: 1	**State:** ME	**City/County:** Saco/York	
SITE STATUS			
NPL Status: ☒ **Final**	☐ **Deleted**	☐ **Other (Specify)**	
Remediation Status (choose all that apply):	☐ **Under Construction**	☐ **Opererating**	**X Complete**
Multiple OUs? ☐ **YES** ☒ **NO**		**Construction completion date: 3-29-05 (PCOR)**	
Has site been put into reuse?	☒ **YES**	☐ **NO**	
REVIEW STATUS			
Lead agency: ☒ **EPA**	☐ **State**	☐ **Tribe**	☐ **Other Federal Agency:**
Author name: Leslie McVickar			
Author title: Remedial Project Manager		**Author affiliation:** U.S. Environmental Protection Agency	
Review period: August 2005- August 2010			
Date(s) of site inspection: 2010			
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ NPL State/Tribe-lead ☐ Non-NPL Remedial Action Site ☐ Regional Discretion			
Review number ☐ 1 (first)	☒ 2 (second)	☐ 3 (third)	☐ Other (specify)
Triggering action ☐ Actual RA Onsite Construction at OU # ☐ Actual RA Start at OU# ☐ Construction Completion ☒ Previous Five-Year Review Report ☐ Other (specify)			
Triggering action date (from WasteLAN): September 29, 2005			
Due date (five years after triggering action date): September 29, 2010			

Five-Year Review Summary Form

Issues:

No major issues were identified as a result of the five-year review.

The only issue to be addressed involves the revision of the cleanup level for arsenic to reflect the new MCL. EPA and the Maine DEP will continue to perform periodic inspections to indicate areas where maintenance may be necessary. The new arsenic MCL will be considered when evaluating the long-term cleanup of the groundwater.

Recommendations and Follow-Up Actions:

Continue monitoring program.

Protective Statements:

All immediate threats at the Site have been addressed, and the remedy is expected to be protective of human health and the environment as a result of the institutional controls, alternative water supply, and the eventual restoration of the groundwater to cleanup levels. The remedy is considered to be protective of human health and the environment in the short-term and long-term. Short-term protectiveness is achieved because:

- There is no current exposure of Site related waste to humans or the environment at levels that would represent a health concern.
- The landfill cover system prevents exposure to the waste material and contaminants within the landfill.
- The public water line has eliminated groundwater use within the area impacted by the landfill.
- The land use restriction prevents any use of the land that would result in an exposure to hazardous substances, pollutants, or contaminants.

Long-term protectiveness will be accomplished through continued performance of operation, maintenance, and monitoring activities along with the eventual restoration of the groundwater. Due to a change in the acceptable level for arsenic in groundwater, a reduction in the cleanup level for arsenic will be necessary prior to the certification that long-term protectiveness has been achieved.

Long-Term Protectiveness:

Long-term protectiveness of the remedial action will be verified through periodic inspections and long-term monitoring of the contaminated groundwater. The data over the past five years indicates that the groundwater plume has not expanded.

Other Comments:

None

1.0 INTRODUCTION

A five-year review was conducted of the remedial actions selected for the Saco Municipal Landfill, in Saco, Maine. The purpose of the five-year review is to determine whether the remedy being implemented at the Site remains protective of human health and the environment. The methods, findings, and conclusions of the five-year review are documented in this Five-Year Review Report. In addition, this report presents issues identified during the review and provides recommendations to address them.

This Five-Year Review Report was prepared pursuant to CERCLA §121 and the National Contingency Plan. CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that the action is appropriate at such site in accordance with section [104] or [106], the president shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR § 300.430 (f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the second five-year review for the Site. The triggering action for this statutory review is the signing of the first five year review on September 29, 2005. The triggering date for the first five year review was the Record of Decision and Preliminary Closeout Report in March 2005. The five-year review is required due to the fact that contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

2.0 SITE CHRONOLOGY

TABLE 1

Date	Event
1963 – 1989	Saco Municipal Landfill operates as a municipal solid waste and industrial waste landfill.
1975	Water line installed to serve adjacent residents
1976	Landfill Area 1 closed and clay cap was installed, clay cap was repaired in 1985
1985	Landfill Area 2 closed with clay cap and leachate recirculation system
1989	Landfill Area 3 and Landfill Area 4 stop receiving waste
1990	Saco Municipal Landfill placed on the National Priorities List
1995	Administrative Order on Consent signed for performance of Remedial Investigation and Feasibility Study
1996	EPA signs Action Memorandum to initiate a Non-Time-Critical Removal Action (NTCRA) to cap Landfill Area 3 and Landfill Area 4
1997-1998	Construction of landfill cap for Landfill Area 3 and Landfill Area 4
2000	EPA signs Record of Decision for Saco Municipal Landfill selecting monitored natural attenuation as the long-term remedial action
2000	EPA determines that the Saco Municipal Landfill is construction complete
2000-2005	Annual monitoring and maintenance activities continue
2005	First Five Year Review
2010	Second Five Year Review

3.0 BACKGROUND

3.1 Physical Characteristics

The Saco Municipal Landfill Superfund Site is located on Foss Road, York County, Maine. The Site occupies 90 acres, of which four separate landfill areas (Areas 1, 2, 3, and 4) comprise approximately 30 acres. The City of Saco owns the Site, and operated the four-landfill areas from 1963 until 1988. In 1990, the U.S. EPA placed the Site on the National Priorities List (NPL).

Area 1 is approximately 10 acres in size and was the original municipal landfill. It operated as an open dump beginning in the early 1960s. Material reportedly disposed in this landfill included, among other things, municipal waste and sludge from the Factory Island Treatment Facility. This area was closed in 1974, re-graded, and covered with a clay cap in 1976. An

additional 18 inches of compacted clay with six inches of seeded topsoil was placed on the landfill in 1985.

Area 2 is approximately 6 acres in size. This landfill area began operation in 1974, and accepted industrial waste, brush, and construction demolition debris. In 1981, the MEDEP issued an Administrative Consent Agreement and Enforcement Order to the City of Saco for closure of this area. Closure of this area was completed in 1985, and included 18 to 20 inch clay cover with four inches of top soil, and a clay slurry wall along the northern edge of the landfill, including a leachate collecting and recirculation system. According to the ROD, the closure of Areas 1 and 2 addressed the principal threats at the Site posed by those areas.

Landfill Area 3, approximately 1 acre in size, was developed around 1985 as an industrial waste area for several local industries. Landfill Area 4 comprises 8 acres. This landfill operated between 1974 and 1989, and accepted primarily municipal waste. Sludge from the tannery wastewater treatment system was reportedly disposed of in Area 4.

3.2 Land and Resource Use

The Site is bordered by wooded areas in all directions except for an open sand and gravel pit to the southwest of Area 4. Private residences are located to the north and east of the Site. Sandy Brook flows through the Site, with Landfill Areas 1 and 2 on the east and Areas 3 and 4 on the west side of the brook. A large housing development and elementary school are located within 0.5 miles downgradient of the Site.

In the spring of 1998, the City of Saco established a Recreation Advisory Committee made up of 11 residents to prepare recommendations for the reuse of the property. The Committee's *Recreation and Reuse Plan*, produced in December of that year, describes a comprehensive vision that incorporates active and passive recreational uses and nature conservation areas. EPA and the Maine Department of Environmental Protection (ME DEP) continue to be available to work with the city to ensure that the intended uses are safe and compatible with the cleanup remedy. Among the reuse plans ball fields and a network of trails provide passive recreation opportunities for hikers, snow-shoers, cross-country skiers, horseback riders, trail runners, and other non-motorized uses. It was intended to link these trails through a right-of-way to the Middle School and nearby woodlands located a short distance to the southeast. This would provide greater pedestrian access and allow for the creation of a cross-country running course for the school.

Reuse plans are currently on hold due to budgetary constraints. There are two soccer fields which are primarily utilized by grade and middle school children and are in use on a non-regular basis. The site property is gated and is locked everyday by the City of Saco at 4 pm.

3.3 History of Contamination

The early environmental investigations identified groundwater and surface water quality problems thought to be caused by leachate outbreaks from the landfills. In response to suspected contamination in nearby shallow wells, the municipal water supply was extended to residents along Buxton Road (Route 112) in 1975.

In 1995, the City of Saco entered into an Administrative Order with the EPA to conduct an RI/FS at the Site. The Phase IA RI Report concluded that Landfill Areas 3 and 4 were causing reducing conditions that mobilized the naturally occurring arsenic and manganese into the groundwater beneath the Site, resulting in the discharge of contaminants to a wetland seep area and into the surface water and sediments of Sandy Brook.

To address the source of contamination for the contaminated groundwater, EPA signed an Action Memorandum in 1996 to initiate a non-time-critical removal action (NTCRA) at the Site. The purpose of the NTCRA was to consolidate and cap contaminated soils, sediments, and wastes within Landfill Areas 3 and 4. The NTCRA was completed in 1999. The NTCRA consisted of the following: excavation of soils/sediments of several groundwater seeps that contained elevated levels of arsenic and placement of these materials beneath the cap for Landfill Areas 3 and 4; excavation of several pockets of solid waste (approximately 5,000 cubic yards) outside the footprint of the existing landfills and consolidation of this solid waste into Landfill Areas 3 and 4; design and construction of a multi-barrier landfill cap over Landfill Areas 3 and 4; development of land use restrictions that will restrict future use of the Site; and creation of a new on-site wetlands area southeast of Landfill Area 4 to compensate for the wetlands impacted by the cap construction.

The RI and Risk Assessments concluded that the groundwater impacted by Landfill Areas 3 and 4 was the only pathway that required action after completion of the NTCRA.

3.4 Initial Response

The City of Saco completed the closure of Landfill 1 and Landfill 2 under the oversight of the State of Maine. In addition, the municipal water supply was extended to residents along Buxton Road (Route 112) in 1975.

3.5 Basis for Taking Action

The baseline Human Health Risk Assessment revealed a potential threat to future residents based on the use of groundwater at the Site as drinking water. Additionally, the Ecological Risk Assessment identified an ecological risk to benthic organisms limited to a small portion of Sandy Brook downstream of the remediated seep and was determined to be minimal and will be addressed through the alternatives addressing groundwater.

4.0 REMEDIAL ACTIONS

4.1 Remedy Selection

Two CERCLA cleanup actions have been implemented at the Site. The first cleanup action was a non-time critical removal action (NTCRA), which was described in a 1996 Action Memorandum. The NTCRA included: construction of a multi-layer landfill cap; passive gas venting system; and institutional controls to protect the cap. The second cleanup action was described in the September 2000 Record of Decision. The second action called for the natural attenuation of the groundwater, continued operation and maintenance of the NTCRA, and long-term monitoring of the Site as the future activities. The 2000 Record of Decision established the following remedial action objectives for the Site:

- Prevent the ingestion of groundwater containing contaminants that exceed Federal or State maximum contaminant levels (MCLs), non-zero maximum contaminant level goals (MCLGs), maximum enforcement guidelines (MEGs), or in their absence, an excess cancer risk of 1x10-6 (one in a million) or a hazard quotient of 1;
- Restore groundwater to meet Federal or State MCLs, MCLGs, MEGs, or in their absence, an excess cancer risk of 1x10-6 (one in a million) or a hazard quotient of 1; and
- Perform long-term monitoring of surface water, sediments, and groundwater to verify that the cleanup programs at the Site are protective of human health and the environment.

The primary expected outcome of the selected remedy is that groundwater will meet cleanup levels specified in the ROD at and beyond the point of compliance within approximately 60 to 100 years.

4.2 Remedy Implementation

The physical construction cleanup activities at the Site were implemented as part of the NTCRA. The NTCRA consisted of the following: excavation of soils/sediments of several groundwater seeps that contained elevated levels of arsenic and placement of these materials beneath the cap for Landfill Areas 3 and 4; excavation of several pockets of solid waste (approximately 5,000 cubic yards) outside the footprint of the existing landfills and consolidation of this solid waste into Landfill Areas 3 and 4; design and construction of a multi-barrier landfill cap over Landfill Areas 3 and 4; development of land use restrictions that will restrict future use of the Site; and creation of a new on-site wetlands area southeast of Landfill Area 4 to compensate for the wetlands impacted by the cap. Construction activities began in June 1997 and were completed in 1998.

EPA signed a Preliminary Closeout Report (PCOR) for the entire Site (NTCRA and Remedial Action) in September 2000 upon completion of the cap. The PCOR confirmed that no additional monitoring wells or other construction activities were necessary at the Site. Institutional Controls for the Site were completed prior to the ROD. Land and groundwater

use has been restricted by the "Grant of Environmental Restrictions and Right of Access" (Environmental Restrictions) agreed to by the City, the USEPA, and the MEDEP. These Environmental Restrictions are considered necessary to ensure long-term protection of public health. The Environmental Restrictions include:

- No use that disturbs the integrity of any layers of the cap, or any other structures for maintaining the effectiveness of the Removal Action, whether in place now or put in place in the future;
- No groundwater use, including, but not limited to, use as a drinking water supply. No groundwater wells shall be installed within the Groundwater Restriction Parcel except for purposes of groundwater monitoring pursuant to a plan approved by the City, USEPA, and the ME DEP;
- No use of the waters of Sandy Brook within the Groundwater Restriction Parcel;
- No residential development and no activity or use at the Site which adversely impacts the Removal Action (NTCRA), whether now or in the future, including, without limitation: (1) systems and areas to collect and/or contain groundwater, surface water runoff, or leachate; (2) systems or containment areas to excavate, dewater, store, treat, and/or dispose of soils and sediments; and (3) systems and studies to provide long-term environmental monitoring of groundwater, surface waters, and to ensure the long-term effectiveness of the Removal Action and its protectiveness of human health and the environment.

The City of Saco ensures that the Institutional Controls remain in effect.

4.3 Operation and Maintenance

The operation, maintenance, and monitoring activities are being implemented by the PRPs. Monitoring and maintenance reports are submitted to EPA and the ME DEP for review. In addition, EPA has an oversight contractor to perform site inspections and oversee the PRP's activities.

The operation, maintenance, and monitoring activities focus on maintenance of the vegetative cover of the cap and repair of any erosion and collection and analysis of samples to monitor trends in groundwater concentrations.

5.0 PROGRESS SINCE LAST REVIEW

As noted above, regular inspections of the Site occur each spring and fall by EPA, the PRPs and the ME DEP. On an as-needed basis minor repairs have been made to maintain the integrity of the cap, the monitoring wells, the gas vents, and the on and off-cap storm water control structures. Any erosion, sedimentation and depressions that have been observed in the past five years have been promptly repaired.

The 2005 Five Year Review report determined that, *"All immediate threats at the Site have been addressed, and the remedy is expected to be protective of human health and the environment as a result of the institutional controls, alternative water supply, and the eventual restoration of the groundwater to cleanup levels.* The remedy is considered to be protective of human health and the environment in the short-term and long-term." There have been no changes during the past five years which have changed this determination.

6.0 FIVE-YEAR REVIEW PROCESS

6.1 Administrative Components

EPA, the lead agency for this five-year review, notified Maine DEP and the PRPs in 2009 that the five-year review would be completed. The Five-Year Review Team was led by Leslie McVickar of EPA, Remedial Project Manager, for the Saco Municipal Landfill Superfund Site, and included staff from EPA's oversight and five year review support contractor Nobis Engineering, Inc. Iver Mcleod of the ME DEP was as also part of the review team. The review components included:

- Community Involvement;
- Document Review;
- Data Review;
- Site Inspection;
- Local Interviews; and
- Five-Year Review Report Development and Review.

6.2 Community Involvement

EPA issued a fact sheet providing public notice of the five year review in March 2010. The fact sheet described the five-year review process and how the community can contribute during the review process.

6.3 Document Review

The five-year review consisted of a review of relevant documents including O&M records and monitoring data. EPA reviewed the September 2002 ROD and the first Five Year Review report. Applicable or relevant and appropriate requirements (ARARs) in effect at the time of the ROD and those that that have been changed since the ROD were also reviewed

6.4 Data Review

Environmental monitoring data are available for groundwater, surface water, and sediments. The following sections provide a summary of findings for each media. Tables 3-1 through 3-3 show the maximum exceedences above cleanup criteria for each year since the 2005 Five Year Review for groundwater, surface water, and sediments .

6.4.1 Groundwater Monitoring Program

EPA reviewed the available long-term monitoring ground water data and compared the results to the Interim Cleanup Levels for arsenic, manganese, and benzene, as well as applicable federal and state criteria for other detected constituents, to assess the effectiveness of the natural attenuation remedy. During this first 5-year review period, groundwater quality has been monitored in approximately 24 monitoring wells. The analytical program is summarized in Table 2-3 of the Long-Term Monitoring Plan (Woodard & Curran, 2001).

Groundwater Elevations

A review of the groundwater elevations and contours provided in the Annual Long-Term Reports shows groundwater flow generally consistent with that described in the ROD.

Contaminant Trends in Groundwater

The evaluation of the data collected as a result of the annual monitoring program reveals no clear trends in contaminant concentration. The extent of contamination remains unchanged from the area defined by the Record of Decision. While the concentrations of the major contaminants of concern demonstrate some annual variability, a review of the data did not reveal any significant trends. Table 3-1 identifies groundwater concentrations and locations exceeding interim clean-up levels at the Saco Landfill from 2005 through 2009.

Table 3-1. Maximum Groundwater Concentrations Exceeding Interim Cleanup Levels for Saco Landfill

Parameter	Nov-05	May-06	Oct-06	May-07	Oct-07	Jun-08	Nov-08	Jun-09	Nov-09
Arsenic (Compared to ICL of 50 µg/L; Maine MEG of 10 µg/L)	1,020 (MW-95-1S)	891 J (MW-95-1S)	971 (MW-95-1S)	4,680 (MW-95-4SB)	665[1] (MW-95-1S)	759 (MW-95-1S)	947 (MW-95-1S)	754 (MW-95-1S)	1,030 (MW-95-1S)
Benzene (Compared to IGL and MCL of 5 µg/L)	8 (MW-95-4RD)	6 (MW-95-4R)	8 (MW-95-4RD)	N/A	6 (MW-95-4R)	N/A	N/A	N/A	N/A
Manganese (Compared to IGL of 200 µg/L; Maine MEG of *500 µg/L*)	18,200 (MW-95-1R)	9,520 (MW-95-1R)	14,600 (MW-95-1R)	9,870 (MW-95-1R)	*16,600* (MW-95-1R)	*10,200* (MW-95-1R)	*11,200* (MW-95-1R)	*7,580* (MW-95-1R)	10,700 (MW-95-1R)

6.4.2 Surface Water

EPA reviewed the surface water data collected from 2005 through 2009 in comparison to applicable criteria to evaluate the effectiveness of the remedy. As specified in the ROD, the Cleanup Levels for surface water are Federal and State water quality criteria. This monitoring consisted of sampling and analysis of surface water samples at nine locations. See Table 3-2 for surface water locations that exceed the interim cleanup levels for the Saco Landfill from 2005 through 2009. These samples were co-located with sediment samples collected at the same time (Table 3-3). The highest metals concentrations have been detected downstream of Areas 3 and 4 in samples collected between the primary seep and the confluence of Sandy and Big Ledge Brooks. All arsenic concentrations in surface water were below the applicable ambient water quality criteria of 150µg/L.

Table 3-2 Maximum Surface Water Concentrations Exceeding Interim Cleanup Levels for Saco Landfill

Parameter	Nov-05	May-06	Oct-06	May-07	Jun-08	Jun-09	Nov-09
Arsenic (Compared to NRWQC of 150 µg/L)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Iron (Compared to NRWQC of 1,000 µg/L)	N/A	1,750 J (SW-13)	1,410 (SW-13)	1,890 J (SW-13)	2,670 (SW-13)	2,810 (SW-52)	1,550 (SW-52)
Manganese (Compared to FWSB of 120 µg/L)	177 J (SW-7)	473 (SW-37)	262 (SW-7)	546 (SW-13)	961 (SW-37)	667 (SW-13)	440 (SW-37)

6.4.3 Sediment

The ROD requires that stream sediments be monitored to verify that contaminant concentrations do not exceed levels considered to be safe to aquatic organisms. Although no cleanup levels were established for sediment, the ecological risk assessment suggested that moderate reduction in growth and reproduction may occur with sediment arsenic concentrations greater than 106 mg/kg (USEPA 2000). The 2008 data indicate there was an exceedance of the 106 mg/kg arsenic interim cleanup level at SD-34. On the other hand, the 2009 data indicate that there were no arsenic concentrations above 106 mg/kg. See Table 3-3 for sediment locations that exceed the interim cleanup levels for the Saco Landfill from 2005 through 2009. Figure 3-1 presents the trend in sediment arsenic concentrations from 2001 to 2009 at locations in Sandy Brook downstream of the remediated ground water seep. Note that 207 mg/kg arsenic was measured at SD-34 in 2008 and 56.3 mg/kg arsenic in 2009. Except for the spurious result in 2009 at SD-34, sediment concentrations have decreased over time

nearer the seep (SD-37, SD-34, SD-31) or remained consistently low further downstream (SD-69 and SD-103).

Table 3-3 Maximum Sediment Concentrations Exceeding Interim Cleanup Levels for Saco Landfill

Parameter	Nov-05	May-06	May-07	Jun-08	Jun-09
Arsenic (Compared to an interim cleanup level of 106 mg/kg)	58.8 (SD-31)	59.5 (SD-31)	58.8 (SD-31)	207 (SD-34)	56.3 (SD-34)
Iron	N/A	24,300 (SD-37)	N/A	29,700 (SD-34)	N/A
Manganese	575 J (SD-7)	1,340 (SD-7)	954 (SD-31)	2,420 (SD-34)	1,020 (SD-31)

6.4.3.1 Human Health Risk Analysis for Potential Direct Contact Sediments

In July 2010, an evaluation of potential human health risks associated with wading in Sandy Brook was performed. This risk assessment was based on the USEPA methodology for Superfund Risk Assessment (e.g., Risk Assessment Guidance for Superfund Sites or "RAGS," 1989 et seq.) and conservatively assumed exposure to a youth trespasser, ages 11-15 years.

This assessment entailed evaluation of dermal contact with and incidental ingestion of surface water and sediment within the portion of the Sandy Brook proximate to Saco Municipal Landfill Superfund Site Areas 2 and 4. To provide the most representative assessment of this scenario, the relevant portion of the Sandy Brook was considered a single exposure point, as described in more detail below. As indicated in the risk characterization portion of the July 2010 memorandum, included in the appendices, the estimated non-cancer risk (hazard quotient) for the receptor is 0.1, below the USEPA risk management criterion of 1. The estimated cancer risk is 4×10^{-6}, which is within the USEPA risk management range of 1×10^{-4} to 1×10^{-6}. Therefore, it has been determined that there is no current unacceptable risk to human health due to a possible exposure to site contaminants.

6.4 Site Inspection

Summary of Current Site Inspection

A site inspection was conducted on June 9, 2010. The site inspection is summarized as follows:

- The surfaces of the landfill cap were in good condition with minimal signs of erosion and holes with no sign of cracks or bulging.

- The slope benches and other drainage ditches were in good condition with no undermining or bypass. Minor sedimentation and vegetation growth were present in three locations.

- The gabion-lined letdown channels on the east end and northeast slope of the landfill were in good condition with no signs of settlement, material degradation, erosion, undercutting, or obstructions. The sump between the southeastern down-drain and the sedimentation basin appear to be in good condition with no obstructions.

- The cover penetrations through the landfill cap (20 passive gas vents) were in good condition. The gas vents were tilting down hill. However, the tilt did not appear to be impacting the effectiveness of the vents.

- The outlet pipes and riprap outlet zone of the drainage layer at the perimeter of the cover system appeared to be in good condition all around the landfill. No apparent damage to the outlet pipes or displacement of the riprap was observed.

- The sedimentation basin and outlet structures appeared to be in good condition, well maintained, and functioning properly.

- The perimeter roads were in good condition with no signs of erosion, ruts, or potholes.

- The wetland compensation area appears to be functioning as designed (see Wetland Assessment in the Appendices).

- In the Fall of 2008, a minor slope failure repair was made on the northern face of the landfill cap between GV-11 and GV-12. Vegetative cover has established and the failure repair area is being monitored.

The inspection checklist is found in the appendices.

Past Inspections

Semi-annual inspections of the Saco Municipal Landfill have been conducted by the PRPs, EPA (EPA's oversight contractor Nobis Engineering), and the ME DEP since 2005. There have been no major issues regarding the operation and maintenance of the landfill remedial system. Operations, maintenance, and monitoring have adequately established the landfill cap and established wetland integrity.

6.5 Interviews

Interviews were conducted concurrently with the Site Inspection on June 9, 2010. A sign in sheet (attached) was used to record the names of the individuals interviewed. All persons in attendance were given the opportunity to ask questions and comment on the condition of the remedy. There were no concerns or comments on the condition of the Site and the Operation and Maintenance of the Site. All in attendance commented that the landfill cap was in good condition and that there are no current significant concerns.

7.0 TECHNICAL ASSESSMENT

7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

Remedial Action Performance

Yes. Evidence to indicate that the remedy is performing as intended includes the following:

- The landfill cap remains intact to isolate and prevent the direct contact with the solid waste contained within the landfill.
- The groundwater contaminant plume has not expanded beyond the area defined by the ROD.
- Groundwater and surface water concentrations remain within the range of concentrations identified in the ROD.
- Except for a spurious result in 2009 at SD-34, sediment concentrations have decreased over time near the seep or remained consistently low downstream.

System Operations/O&M

Operation and maintenance of the cap continues to be effective. Issues identified during the semi-annual site inspections by TRC and Nobis on behalf of the EPA are regularly addressed or continue to be monitored as recommended. The monitoring well network appears to be adequate to define the current extent of the groundwater plume and monitor the progress of the cleanup.

Opportunities for Optimization

The five-year review did not identify any areas where changes in the operating procedures would further optimize the cleanup actions.

Early Indicators of Potential Issues

While the physical components of the remedy are in good condition and appear to be functioning as intended, there is a concern that the groundwater may not achieve the cleanup levels in the time period identified in the ROD. The lack of a trend in groundwater or surface water concentrations suggests that the natural attenuation is proceeding more slowly than anticipated. The long-term monitoring program and future five year reviews will continue to better define this issue.

It has been determined that there is not a vapor intrusion risk from groundwater contamination, due to the proximity of the homes from the groundwater plume. All structures and/or homes are a significant distance from the groundwater contamination.

Implementation of Institutional Controls and Other Measures

A restrictive covenant has been placed on the property to prevent the use of the contaminated groundwater. The main access is fenced and gates locked daily in the evening. No activities were observed that would have violated the institutional controls.

Is There a Need to Update any of the Monitoring Plans used to Evaluate the Performance of the Remedy?

A review of the sampling and analytical procedures was conducted to determine the need to update any of the monitoring plans used to evaluate the performance of the remedy. No changes to the monitoring plans are necessary at this time. However the need for amendments to the monitoring plans will be regularly evaluated.

7.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives Used at the Time of the Remedy Selection Still Valid?

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

No. The exposure assumptions used to develop the Human Health Risk Assessment included:

(1) ingestion of groundwater;
(2) direct contact with leachate; and
(3) inhalation of the VOC contaminants from the soil, groundwater, surface water, and leachate by workers or other individuals.

No individuals are currently exposed to contaminated groundwater. With the installation of the alternate water supply and completion of the landfill cap, exposure assumptions 1 – 3 above have been addressed. While the exposure pathways used at the time of the remedy selection remain the only primary pathways of past, current, or future concern regarding the Site, a conservative human health risk calculation for potential exposure to waders in the

brook downgradient from the landfill was developed and is included in this report. The risk calculations provided in Section 6.4.3.1 above conservatively indicate that there is no unacceptable risk to human health from direct contact with contaminated soil/sediment in the brook. There is no basis to develop or consider additional exposure pathways or risk evaluations.

While there have been some changes to the toxicity data used to develop the human health risk assessment, the cleanup levels are currently at the MCLs that were in place at the time of the ROD. The MCL for arsenic has changed since the signing of the ROD. EPA will adjust the cleanup level for arsenic at some time in the future, prior to certifying that cleanup levels have been achieved. Since there is no current exposure to the Site impacted groundwater, the short-term protectiveness of the cleanup has not changed. It should be noted that the naturally occurring levels of arsenic in the bedrock in the vicinity of the Site have been shown to exceed the MCL for arsenic.

Changes in Standards and To Be Considered Requirements

Applicable or relevant and appropriate requirements (ARARs) were evaluated as part of the 1994 Record of Decision. There has been a change to the ARAR or To Be Considered requirements that were assessed in evaluating the protectiveness of the remedy. This was originally assessed during the first Five-Year Review Report (2005). The cleanup level for arsenic was identified as 50 ug/l in the ROD. Subsequent to the ROD, EPA has reduced the federal MCL for arsenic to 10 ug/l. As described above, this change does not impact the short-term effectiveness of the remedy. A reduction in the cleanup level (after consideration for background) may be necessary to certify that the long-term protectiveness has been achieved. The cover system is complying with all current regulations and guidance.

7.3 Question C: Has Any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No. From all of the activities conducted as part of this five-year review, no new information has come to light which would call into question the effectiveness of the remedy. While a precautionary assessment of potential human health risks of direct contact to contaminants in Sandy Brook was considered (Section 6.4.3.1), no additional new human or ecological receptors have been identified at this time. No evidence of significant damage due to natural disasters or lack of maintenance was noted during the site inspection. The cleanup level for arsenic will need to be lowered to the level of the new MCL prior to completion of the cleanup action, however, the groundwater is many years away from achieving compliance with cleanup levels. The new arsenic MCL may impact the time period required for cleanup, but it does not affect the protectiveness of the remedy since there is no current use of the groundwater.

8.0 ISSUES

The only issue to be addressed involves the revision of the cleanup level for arsenic to reflect the new MCL. EPA and the Maine DEP will continue to perform periodic inspections to indicate areas where maintenance may be necessary. The new arsenic MCL will be considered when evaluating the long-term cleanup of the groundwater.

Table 8 Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
The need to revise the groundwater cleanup level for arsenic to reflect a current MCL will be addressed in the future to evaluate the long-term cleanup of the groundwater	N	Y

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The recommendation and follow-up actions involve the continued oversight of the work being performed by the PRPs to assure compliance with the Consent Decree and Record of Decision requirements.

Table 9 Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
The need to revise the groundwater cleanup level for arsenic to reflect a current arsenic MCL to evaluate the long-term cleanup of the groundwater	Revise the groundwater cleanup level for arsenic in the future to evaluate the long-term cleanup of the groundwater	EPA	EPA/MEDEP	2015	N	Y

10.0 PROTECTIVENESS STATEMENT(S)

The remedy is considered to be protective of human health and the environment in the short-term and long-term. Short-term protectiveness is achieved because:

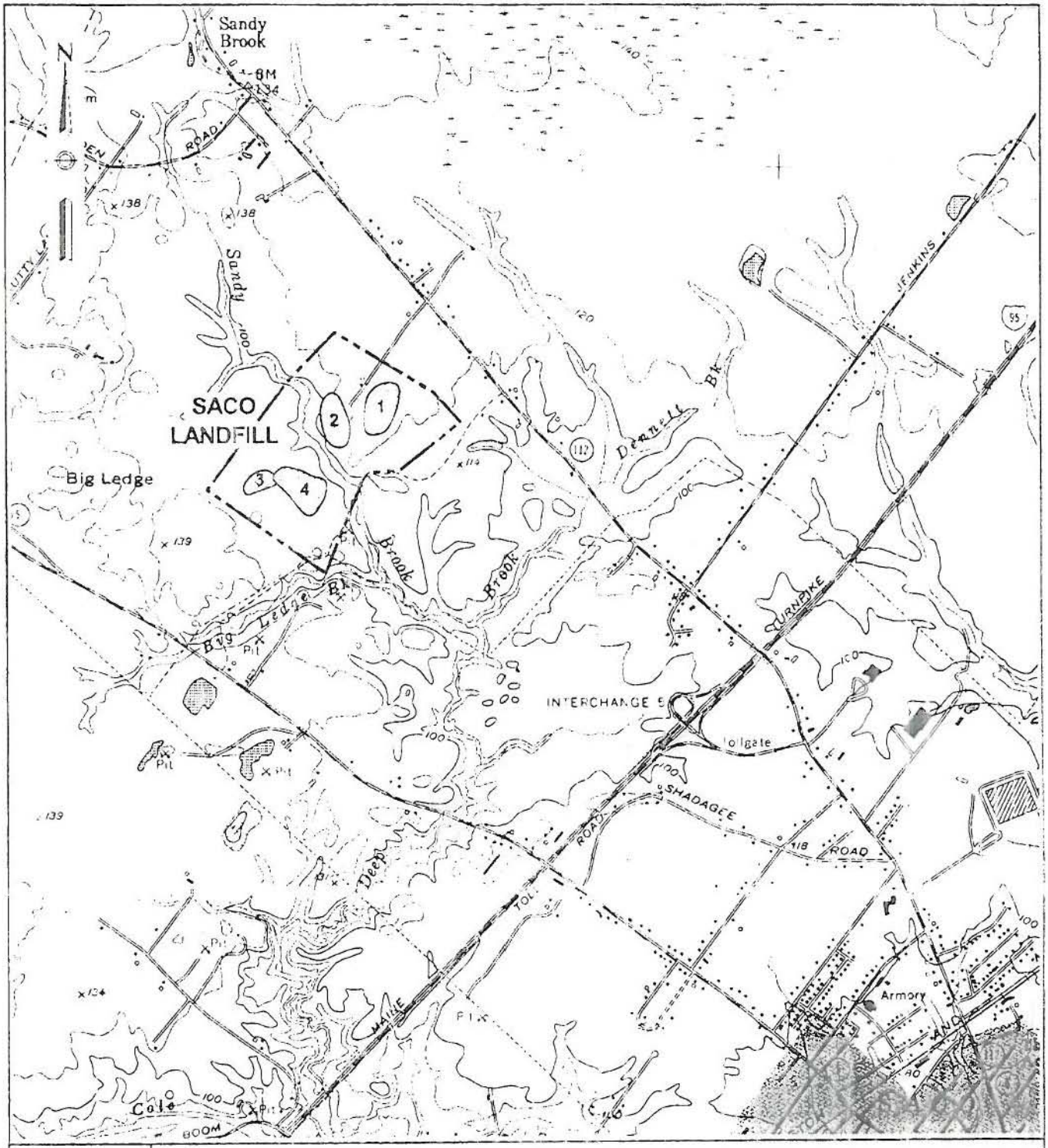
- There is no current exposure of Site related waste to humans or the environment at levels that would represent a health concern.
- The landfill cover system prevents exposure to the waste material and contaminants within the landfill.
- The public water line has eliminated groundwater use within the area impacted by the landfill.
- The land use restriction prevents any use of the land that would result in an exposure to hazardous substances, pollutants, or contaminants.

Long-term protectiveness will be accomplished through continued performance of operation, maintenance, and monitoring activities along with the eventual restoration of the groundwater. A reduction in the cleanup level for arsenic will be necessary prior to the certification that long-term protectiveness has been achieved.

11.0 NEXT REVIEW

The next five-year review will be conducted by September 2015.

FIGURES



Source: USGS Topographic Quadrangle 7.5-Minute Series,
Old Orchard Beach, Maine, 1956
(Photorevised 1970; Photoinspected 1975).

Scale in Feet

0 2000 4000

Figure 1
Site Location Map
Record of Decision
Saco Municipal Landfill
Saco Maine

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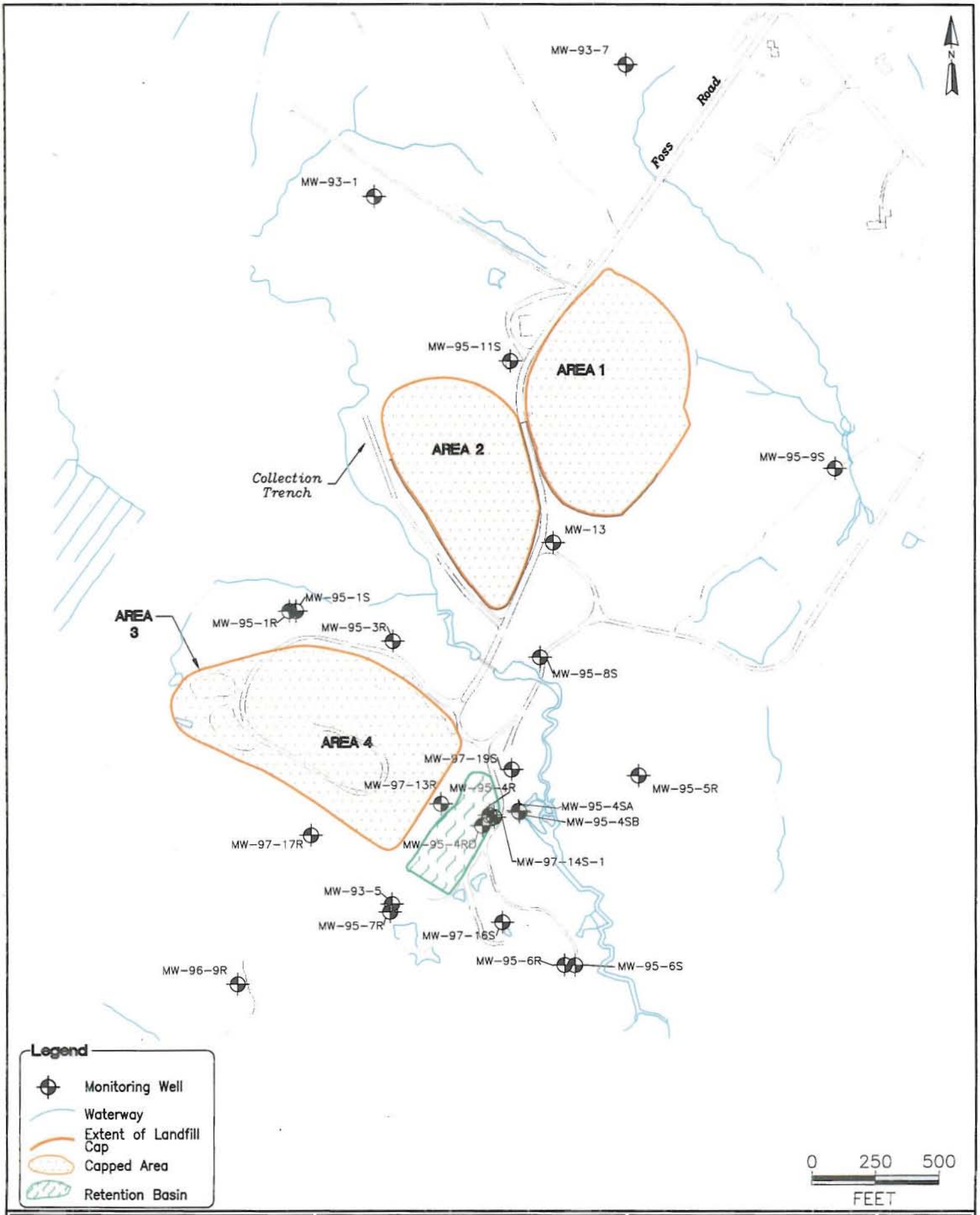
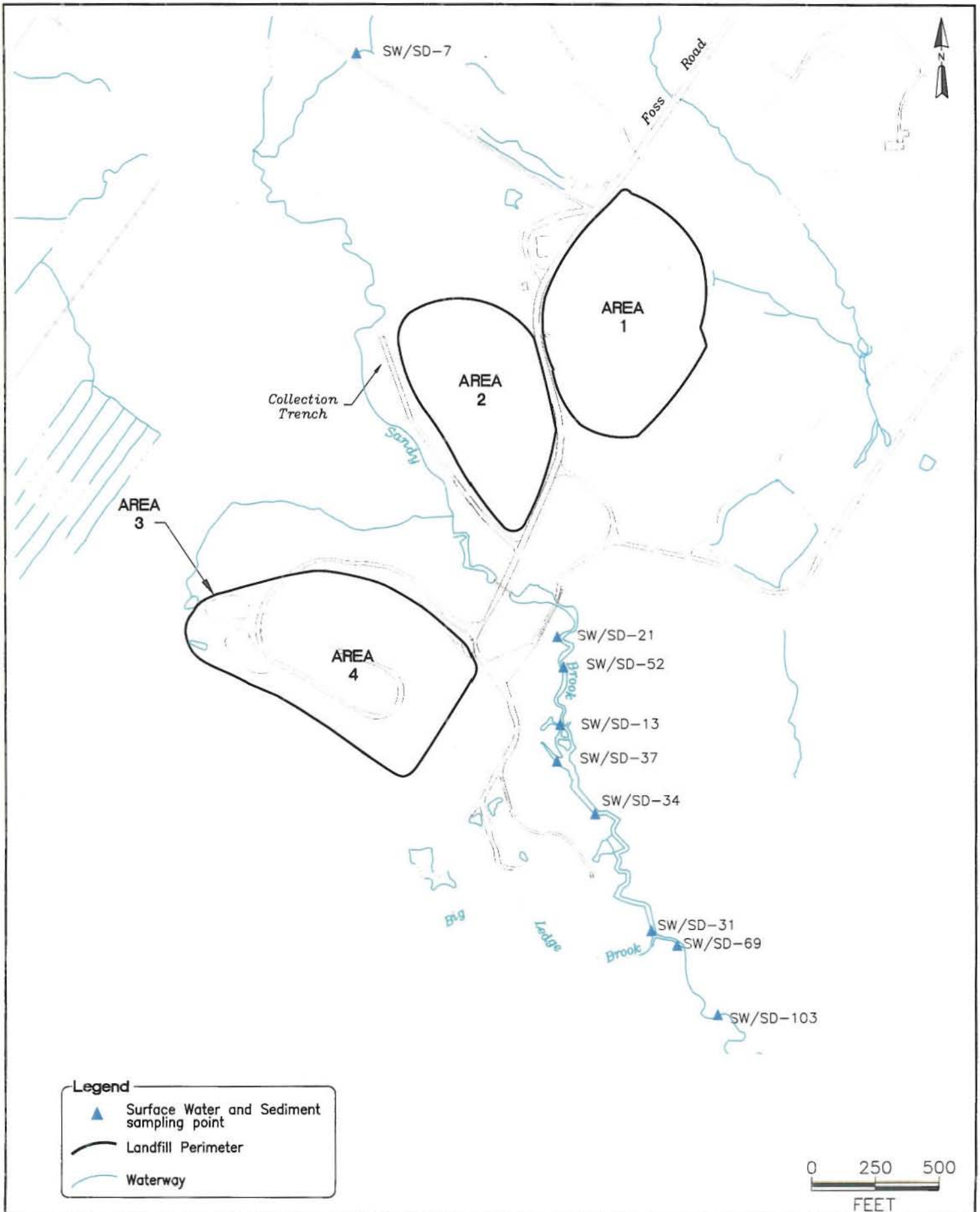
050\3.06\fs\sl.eloc 1



41 HUTCHINS DRIVE PORTLAND, MAINE 04102 800-426-4262 | www.woodardcurran.com COMMITMENT & INTEGRITY DRIVE RESULTS	GROUNDWATER MONITORING LOCATIONS	SACO MUNICIPAL LANDFILL SUPERFUND SITE	JOB NO: 20527507 DATE: FEBRUARY 2009 SCALE: AS NOTED
	DESIGNED BY: EFC CHECKED BY: TE DRAWN BY: PFF 20527507-02-1.dwg	LONG-TERM MONITORING REPORT	FIGURE 2-1



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SURFACE WATER/SEDIMENT SAMPLING LOCATIONS

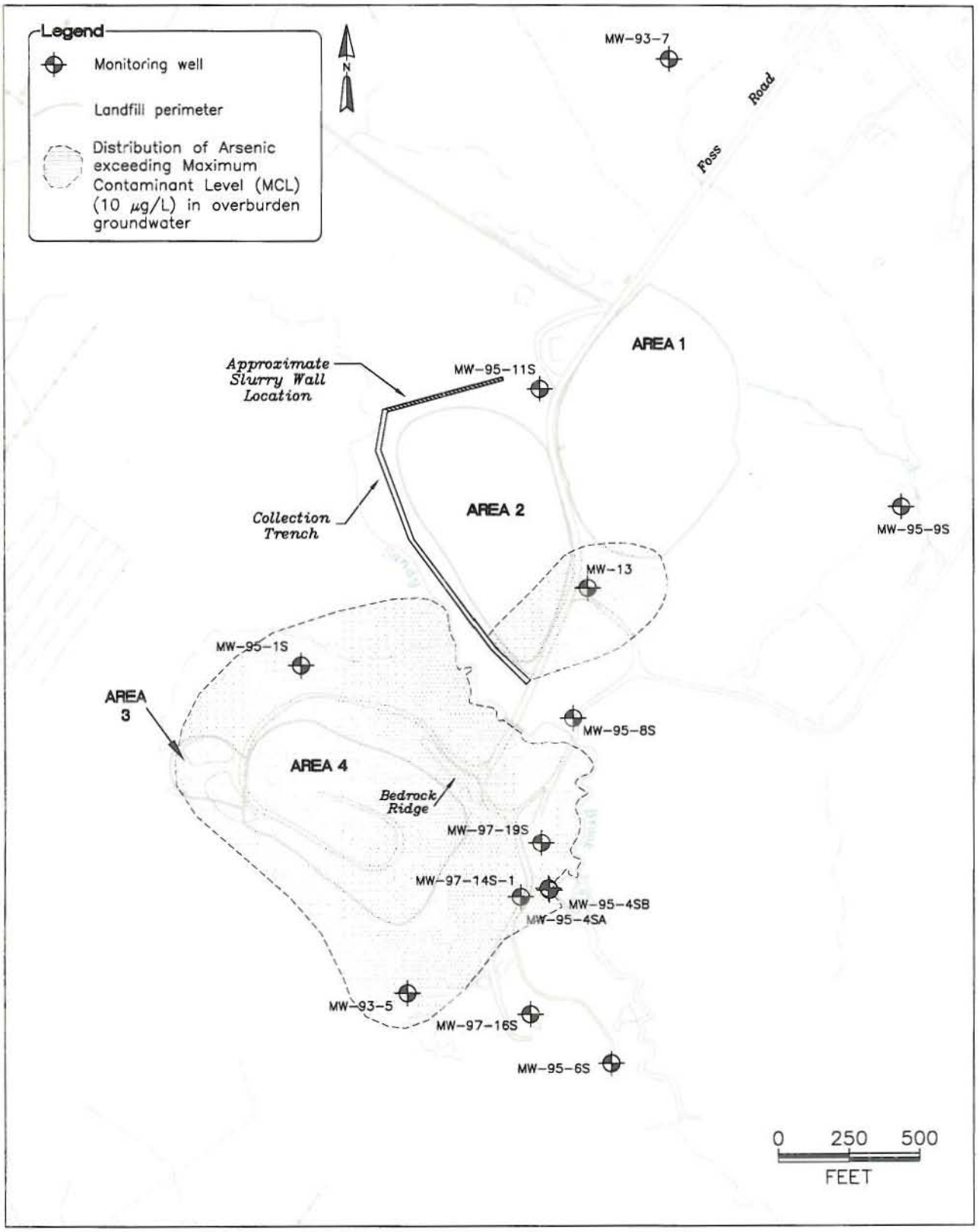
SACO MUNICIPAL LANDFILL SUPERFUND SITE

ANNUAL REPORT

JOB NO. 205275.07
DATE: MARCH 2007
SCALE: AS NOTED

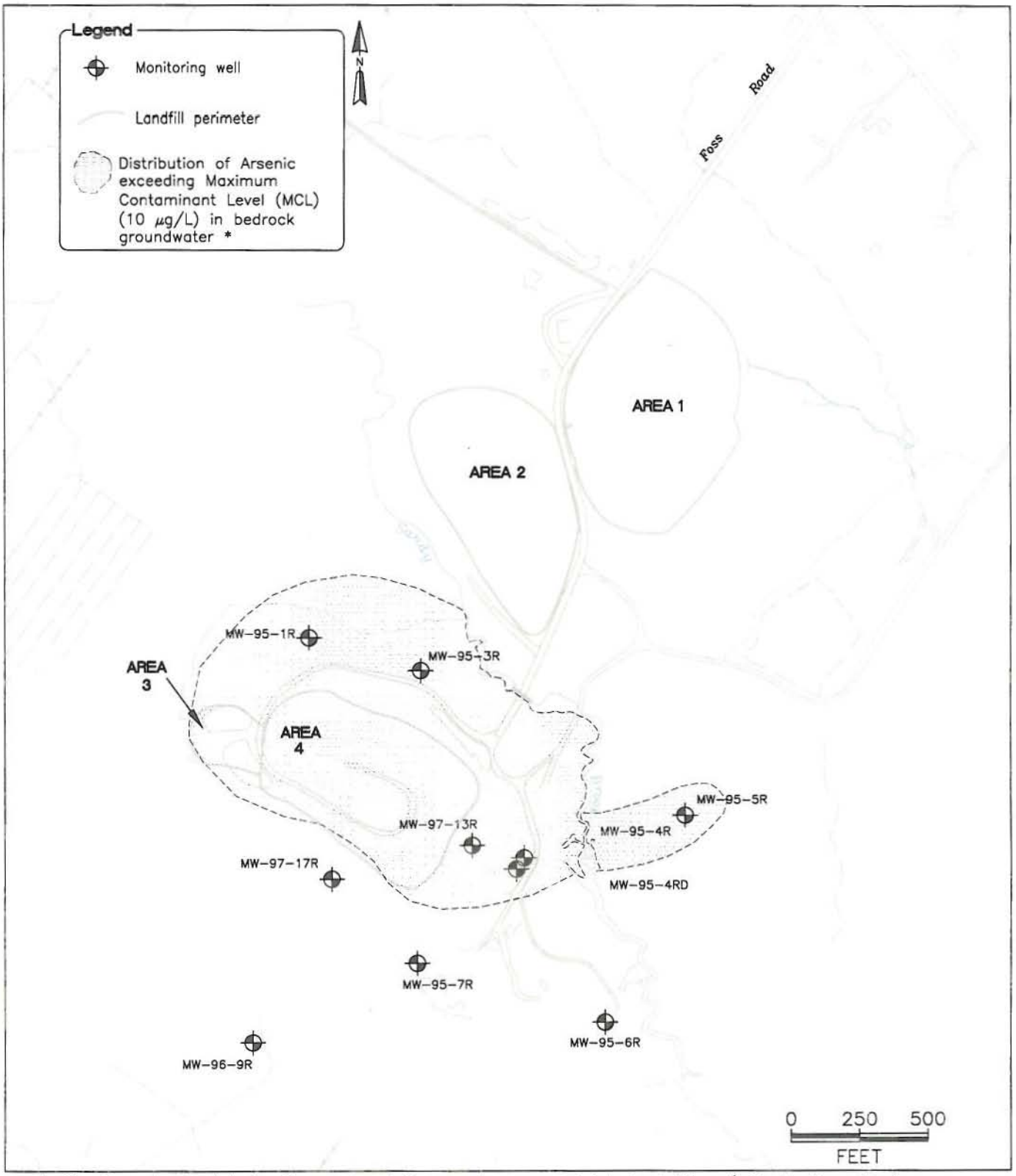
FIGURE 2-2

DESIGNED BY: EFC
DRAWN BY: EFC
CHECKED BY: TE
FILE: 205275G7_G2-2



WOODARD & CURRAN 41 HUTCHINS DRIVE PORTLAND, MAINE 04102 800.426.4262 | www.woodardcurran.com COMMITMENT & INTEGRITY DRIVE RESULTS	INTERPRETIVE GROUNDWATER PLUME MAP OVERBURDEN, JUNE 2009	SACO MUNICIPAL LANDFILL SACO, MAINE	JOB NO: 205275.01 DATE: AUGUST 2010 SCALE: AS NOTED
	DESIGNED BY: EF DRAWN BY: PFF	CHECKED BY: EF 205275-overburden 6-09.dwg	

205275/wip/5 year review/2009-fig/arsenic plume

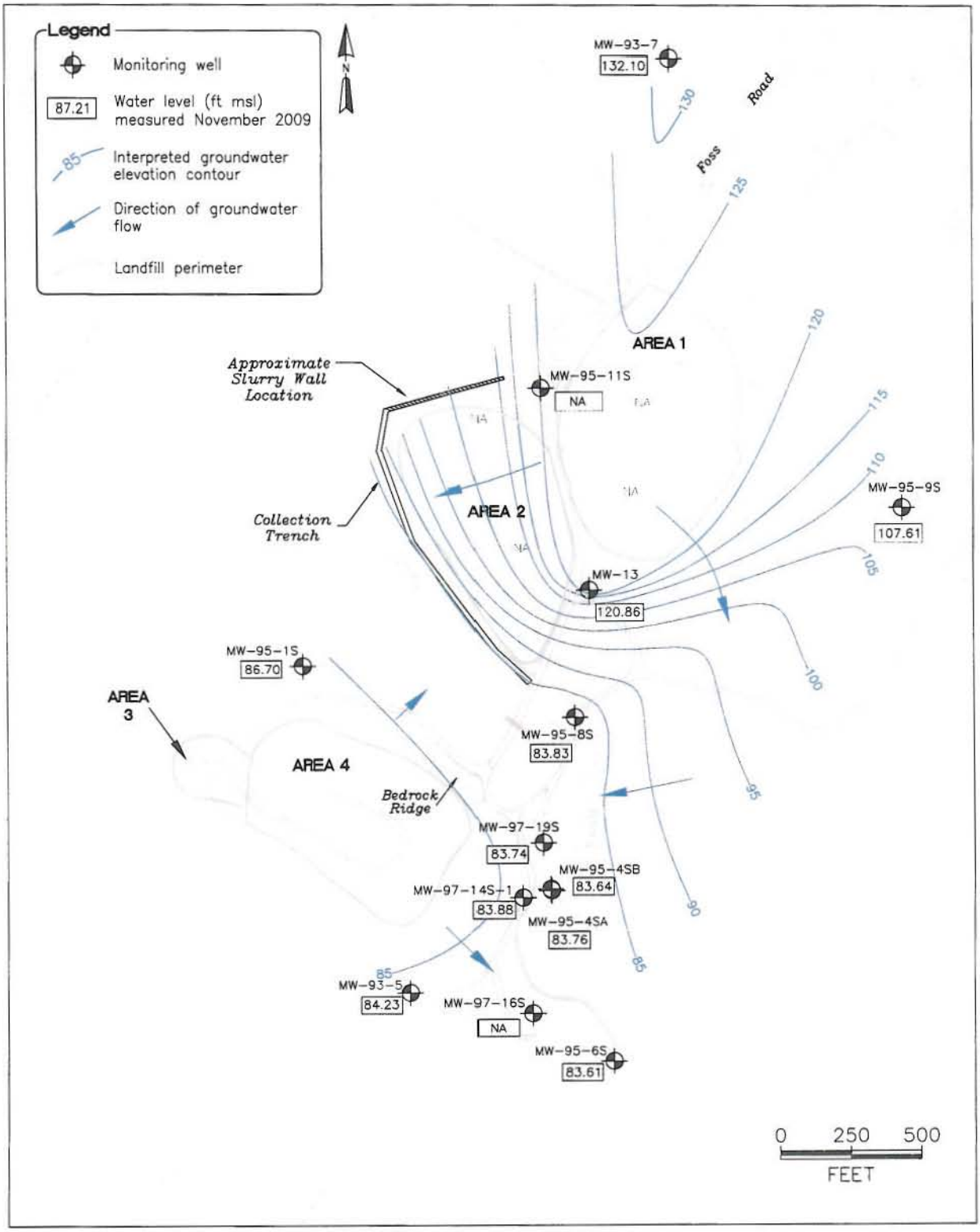


* The Groundwater Interim Cleanup Level for arsenic was established at 50 µg/L in the Record of Decision for the Site dated September 2000.

Note: Well MW-96-9R is cross-gradient to Area 4. Although the arsenic concentration in the well exceeds the MCL, it is attributed to naturally-occurring arsenic in the bedrock.

WOODARD &CURRAN 41 HUTCHINS DRIVE PORTLAND, MAINE 04102 800.426.4262 | www.woodardcurran.com COMMITMENT & INTEGRITY DRIVE RESULTS	INTERPRETIVE GROUNDWATER PLUME MAP BEDROCK, JUNE 2009 DESIGNED BY: EF | CHECKED BY: EF DRAWN BY: PFF | 205275Bedrock 6-02-2.dwg	SACO MUNICIPAL LANDFILL SACO, MAINE	JOB NO: 205275.01 DATE: AUGUST 2010 SCALE: AS NOTED

205275/wip/5-year review/2009 fig/arsenic plume



WOODARD & CURRAN 41 HUTCHINS DRIVE PORTLAND, MAINE 04102 800.426.4262 | www.woodardcurran.com COMMITMENT & INTEGRITY DRIVE RESULTS	GROUNDWATER CONTOUR MAP SHALLOW OVERBURDEN, NOVEMBER 2009 DESIGNED BY: DS CHECKED BY: EF DRAWN BY: BL 205275f03-1gw.dwg	SACO MUNICIPAL LANDFILL SACO, MAINE ANNUAL MONITORING REPORT	JOB NO: 205275.01 DATE: FEBRUARY 2010 SCALE: AS NOTED FIGURE 3-1

205275/wip/cad/2009

TABLES

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Background															
	GW-Benchmarks	Benchmark Source	MW-93-1 11/9/2005 Primary	MW-93-1 5/31/2006 Primary	MW-93-1 10/31/2006 Primary	MW-93-1 5/30/2007 Primary	MW-93-1 10/31/2007 Primary	MW-93-1 6/18/2008 Primary	MW-93-1 11/19/2008 Primary	MW-93-1 6/2/2009 Primary	MW-93-1 11/4/2009 Primary	MW-93-7 11/9/2005 Primary	MW-93-7 6/1/2006 Primary	MW-93-7 10/31/2006 Primary	MW-93-7 5/31/2007 Primary	MW-93-7 10/31/2007 Primary	MW-93-7 6/19/2008 Primary	MW-93-7 11/20/2008 Primary
Volatile Organic Compounds (ug/l)																		
Acetone	6,300	MEG	-	-	-	-	-	-	-	<5	<5	-	-	-	-	-	-	-
Benzene	5	MCL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
n-Butylbenzene	NA	NA	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
sec-Butylbenzene	NA	NA	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Chlorobenzene	91	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Chloroethane	21000	RSL	-	-	-	-	-	-	-	<2J	<2	-	-	-	-	-	-	-
2-Chlorotoluene	140	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2-Dichlorobenzene	63	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,3-Dichlorobenzene	60	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Dichlorodifluoromethane	1400	MEG	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-
1,1-Dichloroethane	70	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2-Dichloroethane	4	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2-Dichloroethene	NA	NA	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	70	MCL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,4-Dichlorobenzene	21	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Ethylbenzene	70	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Hexachlorobutadiene	4	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Isopropylbenzene	680	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
4-Isopropyltoluene	NA	NA	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Naphthalene	14	MEG	-	-	-	-	-	-	-	<1	<1UJ	-	-	-	-	-	-	-
1-Phenylpropane	NA	NA	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Tetrahydrofuran	70	MEG	-	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-
Toluene	1000	MCL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	29	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	70	MCL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	15	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	370	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
m&p-Xylene	1200	RSL	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-
o-Xylene	1200	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Total xylenes	1400	MEG	-	-	-	-	-	-	-	<3	<3	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (ug/l)																		
bis(2-Ethylhexyl) phthalate	6	MCL	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-
Diethylphthalate	29000	RSL	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Background																
	GW-Benchmarks	Benchmark Source	MW-93-1 11/9/2005 Primary	MW-93-1 5/31/2006 Primary	MW-93-1 10/31/2006 Primary	MW-93-1 5/30/2007 Primary	MW-93-1 10/31/2007 Primary	MW-93-1 6/18/2008 Primary	MW-93-1 11/19/2008 Primary	MW-93-1 6/2/2009 Primary	MW-93-1 11/4/2009 Primary	MW-93-7 11/9/2005 Primary	MW-93-7 6/1/2006 Primary	MW-93-7 10/31/2006 Primary	MW-93-7 5/31/2007 Primary	MW-93-7 10/31/2007 Primary	MW-93-7 6/19/2008 Primary	MW-93-7 11/20/2008 Primary
Total Inorganic Analytes (ug/l)																			
Aluminum	1430	MEG	-	-	-	-	-	-	-	309	<54.4U	-	-	-	-	-	-	-	
Arsenic	10	MCL	26.1	28.8J	27.3	32.8	30	28.9	30.2	31	27.1	<8.0	<8.0J	<8.0	<8.0U	<8.0	<8.0	<1.3U	
Barium	2000	MCL	-	-	-	-	-	-	-	5.8J	4.9J	-	-	-	-	-	-	-	
Beryllium	4	MCL	-	-	-	-	-	-	-	<5	<5.0	-	-	-	-	-	-	-	
Cadmium	3.5	MEG	-	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-	
Calcium	NA	NA	20200	21200J	21600	23000	21300	20200	21000	19300	21400	10500	21600J	21400	15100	11600	11200	11600	
Chromium	40	MEG	-	-	-	-	-	-	-	0.74J	<15	-	-	-	-	-	-	-	
Cobalt	11	RSL	-	-	-	-	-	-	-	<30	<30	-	-	-	-	-	-	-	
Copper	1300	MCL	-	-	-	-	-	-	-	10.5J	<25	-	-	-	-	-	-	-	
Iron	26,000	RSL	46.6	<100U	<60.9U	40.4J	<100UJ	61.3J	372	301	<44.4U	402	<100U	409	160	<100UJ	83.3J	139	
Lead	10	MEG	-	-	-	-	-	-	-	2J	<1.8U	-	-	-	-	-	-	-	
Magnesium	NA	NA	4990	4960J	4880	5350	5460	4580	5220	5420	4870	3920	6550J	6760	4840	4120	3520	3810	
Manganese	200	ICL	62.4	57.9	57.3	62.9	59.8	54.9	63.4	58.1	58.2	21	29.6	36.9	26.6	22.4	21.6	25.5	
Nickel	140	MEG	-	-	-	-	-	-	-	<40	<40	-	-	-	-	-	-	-	
Potassium	NA	NA	-	-	-	-	-	-	-	3760	3510	-	-	-	-	-	-	-	
Silver	35	MEG	-	-	-	-	-	-	-	<15	<15	-	-	-	-	-	-	-	
Sodium	20000	MEG	-	-	-	-	-	-	-	28800	29400	-	-	-	-	-	-	-	
Vanadium	180	RSL	-	-	-	-	-	-	-	<25	<25	-	-	-	-	-	-	-	
Zinc	2000	MEG	-	-	-	-	-	-	-	4.9J	<3.2U	-	-	-	-	-	-	-	
Dissolved Inorganic Analytes (ug/l)																			
Arsenic	10	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium	2000	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cadmium	3.5	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Calcium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cobalt	11	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Iron	26000	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Lead	10	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Magnesium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	200	ICL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Potassium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silver	35	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sodium	20000	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Water Quality Analyses (ug/l)																			
Hardness (as CaCO3)	NA	NA	71000	73500J	74100	79400	75600	69400	73800	70400	73600	42400	81000J	81200	57700	45900	42500	44600	
Residue, filterable	NA	NA	180000	400000	150000	96000	120000	160000	450000J	160000	140000	240000	580000	360000	270000	260000	220000	310000J	
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
MEG = Maine Maximum Exposure Guideline, 2008.
RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From:
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_sl_table_run_DEC2009.pdf
NA = No standard or benchmark is available for this constituent.
ICL = Interim Cleanup Level from the Record of Decision

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Background (cont.)		Landfill Areas 1 & 2												
			MW-93-7	MW-93-7	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-95-5R	MW-95-8S	MW-95-8S	MW-95-8S
	GW-Benchmarks	Benchmark Source	6/4/2009 Primary	11/6/2009 Primary	11/10/2005 Primary	5/31/2006 Primary	10/30/2006 Primary	5/30/2007 Primary	10/31/2007 Primary	6/18/2008 Primary	11/20/2008 Primary	6/2/2009 Primary	11/5/2009 Primary	6/3/2009 Primary	11/9/2005 Primary	5/31/2006 Primary	10/31/2006 Primary
Volatile Organic Compounds (ug/l)																	
Acetone	6,300	MEG	<5	<5	<5J	<9UJ	<5J	5J	7	8	<5	8	<5U	<5	-	-	-
Benzene	5	MCL	<1	<1	1	1	0.7J	1	1	1	1	0.9J	1	<1	-	-	-
n-Butylbenzene	NA	NA	<1	<1	<1	<1	<1	<1	<1	0.4J	<1	<1	0.2J	<1	-	-	-
sec-Butylbenzene	NA	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
Chlorobenzene	91	RSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
Chloroethane	21000	RSL	<2	<2	4	5	4	5	5	5	4	4	4	<2J	-	-	-
2-Chlorotoluene	140	MEG	<1	<1UJ	<1	<1	<1	<1	<1	<1	<1	<1J	<1	<1	-	-	-
1,2-Dichlorobenzene	63	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
1,3-Dichlorobenzene	60	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
Dichlorodifluoromethane	1400	MEG	<2	<2	<2	0.7J	0.6J	<2	<2	<2	<2	<2	0.3J	<2	-	-	-
1,1-Dichloroethane	70	MEG	<1	<1	29	34	26	36	31	36	29	27	27	<1	-	-	-
1,2-Dichloroethane	4	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
1,2-Dichloroethene	NA	NA	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	-	-
cis-1,2-Dichloroethene	70	MCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
1,4-Dichlorobenzene	21	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
Ethylbenzene	70	MEG	<1	<1	0.4J	<1	<1	<1	<1	0.3J	<1	<1	<1	<1	-	-	-
Hexachlorobutadiene	4	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
Isopropylbenzene	680	RSL	<1	<1	<1	0.4J	<1	<1	0.5J	0.5J	0.5J	<1	0.4J	<1	-	-	-
4-Isopropyltoluene	NA	NA	<1	<1	0.9J	0.4J	0.5J	<1	0.5J	0.7J	0.5J	0.3J	0.4J	<1	-	-	-
Naphthalene	14	MEG	<1	<1	2	5J	3	4	4	6	0.7J	2	3	<1	-	-	-
1-Phenylpropane	NA	NA	<1	<1	<1	0.8J	<1	0.8J	0.9J	1	0.9J	0.6J	0.7J	<1	-	-	-
Tetrahydrofuran	70	MEG	<10	<10	<10	3J	<10J	<10J	4J	3J	<10	<10	3J	<10	-	-	-
Toluene	1000	MCL	<1	<1	<1	1.0J	0.5J	0.9J	0.7J	0.9J	0.6J	0.7J	0.5J	<1	-	-	-
1,2,3-Trichlorobenzene	29	RSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
1,2,4-Trichlorobenzene	70	MCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
1,2,4-Trimethylbenzene	15	RSL	<1	<1	11	11	7	12	10	13	9	6	7	<1	-	-	-
1,3,5-Trimethylbenzene	370	RSL	<1	<1	3	3	1.0J	3	3	4	2	1	2	<1	-	-	-
m&p-Xylene	1200	RSL	<2	<2	<2	1J	<2	2J	2J	2	1J	1J	1J	<2	-	-	-
o-Xylene	1200	RSL	<1	<1	0.5J	2	0.8J	2	1	2	1	1J	1	<1	-	-	-
Total xylenes	1400	MEG	<3	<3	<3	3J	<3	3	3	4	3J	2J	2J	<3	-	-	-
Semi-Volatile Organic Compounds (ug/l)																	
bis(2-Ethylhexyl) phthalate	6	MCL	2J	-	-	-	-	-	-	-	-	<9	-	<9	-	-	-
Diethylphthalate	29000	RSL	<9	-	-	-	-	-	-	-	-	<9	-	<9	-	-	-

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Background (cont.)		Landfill Areas 1 & 2												
	GW-Benchmarks	Benchmark Source	MW-93-7 6/4/2009 Primary	MW-93-7 11/6/2009 Primary	MW-13 11/10/2005 Primary	MW-13 5/31/2006 Primary	MW-13 10/30/2006 Primary	MW-13 5/30/2007 Primary	MW-13 10/31/2007 Primary	MW-13 6/18/2008 Primary	MW-13 11/20/2008 Primary	MW-13 6/2/2009 Primary	MW-13 11/5/2009 Primary	MW-95-5R 6/3/2009 Primary	MW-95-8S 11/9/2005 Primary	MW-95-8S 5/31/2006 Primary	MW-95-8S 10/31/2006 Primary
Total Inorganic Analytes (ug/l)																	
Aluminum	1430	MEG	<137U	<63.8U	-	-	-	-	-	-	-	136J	<23.4U	<358U	-	-	-
Arsenic	10	MCL	<8	<8.0	41.7	36.5J	42.8	39.4	47.8	41	42.2	34.9	46.3	17.8	2	14.0J	<14.2U
Barium	2000	MCL	20	30.6	-	-	-	-	-	-	-	18.8	24.5	22.7	-	-	-
Beryllium	4	MCL	0.15J	<0.22U	-	-	-	-	-	-	-	<0.15U	<5.0	<5	-	-	-
Cadmium	3.5	MEG	<0.39U	<0.47U	-	-	-	-	-	-	-	0.85J	<0.18U	<10	-	-	-
Calcium	NA	NA	21500	31200	60700	66200J	60900	68200	62500	65400	60500	53800	65000	10500	17600	13400J	17900
Chromium	40	MEG	<15	<0.89U	-	-	-	-	-	-	-	<15	<1.1U	<0.8U	-	-	-
Cobalt	11	RSL	<30	<30	-	-	-	-	-	-	-	4.9J	3.1J	<30	-	-	-
Copper	1300	MCL	<25UJ	<25	-	-	-	-	-	-	-	7.2J	<25	<6.4UJ	-	-	-
Iron	26,000	RSL	277	140	71100	82400	69900	84800	73400J	83000	64000	67500	69100	<394U	2580	24800	22800
Lead	10	MEG	<5	<5.0	-	-	-	-	-	-	-	2.5J	<3.4U	<5	-	-	-
Magnesium	NA	NA	6180	7480	22300	23700J	21300	24900	25100	24600	22300	21500	21800	8590	13400	14400J	17200
Manganese	200	ICL	119	159	3320	3570	2800	3750	3000	3250	2830	2950	2610	36.4	138	267	259
Nickel	140	MEG	<40	<0.82U	-	-	-	-	-	-	-	<40	<40	<0.92U	-	-	-
Potassium	NA	NA	4440	5830	-	-	-	-	-	-	-	7300	8480	6240J	-	-	-
Silver	35	MEG	<15	<0.67U	-	-	-	-	-	-	-	<15	<15	<15	-	-	-
Sodium	20000	MEG	78100	103000	-	-	-	-	-	-	-	64800	72100	144000J	-	-	-
Vanadium	180	RSL	<25	<25	-	-	-	-	-	-	-	<25	<0.72U	<25	-	-	-
Zinc	2000	MEG	<2.4UJ	<4.7U	-	-	-	-	-	-	-	5.3J	<19.2U	<4.4UJ	-	-	-
Dissolved Inorganic Analytes (ug/l)																	
Arsenic	10	MCL	-	-	-	-	-	-	-	-	-	-	-	-	<8.0	3.7J	<4.5U
Barium	2000	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	26000	RSL	-	-	-	-	-	-	-	-	-	-	-	-	23.2	2150	8200
Lead	10	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	200	ICL	-	-	-	-	-	-	-	-	-	-	-	-	12.4	25.3	86.6
Potassium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Quality Analyses (ug/l)																	
Hardness (as CaCO3)	NA	NA	79100	109000	243000	263000J	240000	273000	260000	264000	243000	223000	252000	61500	99000	92800J	116000
Residue, filterable	NA	NA	360000	370000	590000	1400000	520000	550000	420000	520000	520000J	430000	480000	450000	240000	1300000	200000
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.

MEG = Maine Maximum Exposure Guideline, 2008.

RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From:
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_

NA = No standard or benchmark is available for this constituent.

ICL = Interim Cleanup Level from the Record of Decision

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 1 & 2 (cont.)															
			MW-95-8S	MW-95-8S	MW-95-8S	MW-95-8S	MW-95-8S	MW-95-8S	MW-95-9S	MW-95-9S	MW-95-9S	MW-95-9S	MW-95-9S	MW-95-9S	MW-95-9S	MW-95-9S	MW-95-9S	MW-95-11S
	GW-Benchmarks	Benchmark Source	5/31/2007 Primary	10/31/2007 Primary	6/18/2008 Primary	11/20/2008 Primary	6/3/2009 Primary	11/5/2009 Primary	11/9/2005 Primary	5/31/2006 Primary	10/31/2006 Primary	5/31/2007 Primary	10/31/2007 Primary	6/18/2008 Primary	11/20/2008 Primary	6/3/2009 Primary	11/5/2009 Primary	11/6/2009 Primary
Volatile Organic Compounds (ug/l)																		
Acetone	6,300	MEG	-	-	-	-	<5	<5	-	-	-	-	-	-	-	<5	<5	<5
Benzene	5	MCL	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
n-Butylbenzene	NA	NA	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
sec-Butylbenzene	NA	NA	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
Chlorobenzene	91	RSL	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
Chloroethane	21000	RSL	-	-	-	-	<2J	<2	-	-	-	-	-	-	-	<2J	<2	<2
2-Chlorotoluene	140	MEG	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
1,2-Dichlorobenzene	63	MEG	-	-	-	-	<1	<1	<10	<10J	<10	<10	<11	<10	<9	<1	<1	<1
1,3-Dichlorobenzene	60	MEG	-	-	-	-	<1	<1	<10	<10J	<10	<10	<11	<10	<9	<1	<1	<1
Dichlorodifluoromethane	1400	MEG	-	-	-	-	<2	<2	-	-	-	-	-	-	-	<2	<2	<2
1,1-Dichloroethane	70	MEG	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
1,2-Dichloroethane	4	MEG	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
1,2-Dichloroethene	NA	NA	-	-	-	-	<2	<2	-	-	-	-	-	-	-	<2	<2	<2
cis-1,2-Dichloroethene	70	MCL	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
1,4-Dichlorobenzene	21	MEG	-	-	-	-	<1	<1	<10	<10	<10	<10	<11	<10	<9	<1	<1	<1
Ethylbenzene	70	MEG	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
Hexachlorobutadiene	4	MEG	-	-	-	-	<1	<1	<10	<10	<10	<10	<11	<10	<9	<1	<1	<1
Isopropylbenzene	680	RSL	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
4-Isopropyltoluene	NA	NA	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
Naphthalene	14	MEG	-	-	-	-	<1	<1	<10	<10	<10	<10	<11	<10	<9	<1	<1	<1
1-Phenylpropane	NA	NA	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
Tetrahydrofuran	70	MEG	-	-	-	-	<10	<10	-	-	-	-	-	-	-	<10	<10	<10
Toluene	1000	MCL	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
1,2,3-Trichlorobenzene	29	RSL	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
1,2,4-Trichlorobenzene	70	MCL	-	-	-	-	<1	<1	<10	<10	<10	<10	<11	<10	<9	<1	<1	<1
1,2,4-Trimethylbenzene	15	RSL	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
1,3,5-Trimethylbenzene	370	RSL	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
m&p-Xylene	1200	RSL	-	-	-	-	<2	<2	-	-	-	-	-	-	-	<2	<2	<2
o-Xylene	1200	RSL	-	-	-	-	<1	<1	-	-	-	-	-	-	-	<1	<1	<1
Total xylenes	1400	MEG	-	-	-	-	<3	<3	-	-	-	-	-	-	-	<3	<3	<3
Semi-Volatile Organic Compounds (ug/l)																		
bis(2-Ethylhexyl) phthalate	6	MCL	-	-	-	-	<10	-	<10	<10J	<10	<10	<11	<10	<9	<9	<10	<9
Diethylphthalate	29000	RSL	-	-	-	-	<10	-	<10	<10J	<10	<10	<11	<10	<9	<9	<10	<9

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 1 & 2 (cont.)															
	GW-Benchmarks	Benchmark Source	MW-95-8S 5/31/2007 Primary	MW-95-8S 10/31/2007 Primary	MW-95-8S 6/18/2008 Primary	MW-95-8S 11/20/2008 Primary	MW-95-8S 6/3/2009 Primary	MW-95-8S 11/5/2009 Primary	MW-95-9S 11/9/2005 Primary	MW-95-9S 5/31/2006 Primary	MW-95-9S 10/31/2006 Primary	MW-95-9S 5/31/2007 Primary	MW-95-9S 10/31/2007 Primary	MW-95-9S 6/18/2008 Primary	MW-95-9S 11/20/2008 Primary	MW-95-9S 6/3/2009 Primary	MW-95-9S 11/5/2009 Primary	MW-95-11S 11/6/2009 Primary
Total Inorganic Analytes (ug/l)																		
Aluminum	1430	MEG	-	-	-	-	813	1280	-	-	-	-	-	-	-	670	<86.6UJ	240J
Arsenic	10	MCL	13.1	15	5.0J	<5.3U	<8	4.5J	3	<8.0J	<8.0	<8.0U	<8.0U	<8.0	<2.9U	<8	<8.0	<8.0
Barium	2000	MCL	-	-	-	-	4J	9.1	-	-	-	-	-	-	-	3.7J	4.7J	<1.5U
Beryllium	4	MCL	-	-	-	-	<0.11U	<5.0	-	-	-	-	-	-	-	<0.15U	<5.0	<5.0
Cadmium	3.5	MEG	-	-	-	-	<0.07U	<10	-	-	-	-	-	-	-	<10	<10	<10
Calcium	NA	NA	10900	16200	9850	9500	7790	9080	8700	6880J	7350	6260	4940	3360	5640	3360	9640	6100
Chromium	40	MEG	-	-	-	-	<1U	2.3J	-	-	-	-	-	-	-	<15	<15	<0.80U
Cobalt	11	RSL	-	-	-	-	<30	<1.2U	-	-	-	-	-	-	-	0.25J	<0.76U	<30
Copper	1300	MCL	-	-	-	-	<2.3U	<2.1U	-	-	-	-	-	-	-	<1.3UJ	<1.1U	<0.68U
Iron	26,000	RSL	15400	20600J	4800	2900	848	1540	466	681	550	813	922	2530	1200	763	205	253
Lead	10	MEG	-	-	-	-	2J	<6.4U	-	-	-	-	-	-	-	1.6J	<3.8U	<5.0
Magnesium	NA	NA	11000	18000	8670	8380	7550	7360	4960	3970J	3850	3320	2540	1650	3100	2170	5350	2380
Manganese	200	ICL	181	248	65.4	50.2	23.3	58.7	399	523	296	359	630	361	439	407	421	<4.5U
Nickel	140	MEG	-	-	-	-	<2.4U	4.0J	-	-	-	-	-	-	-	<1.5U	<0.67U	<40
Potassium	NA	NA	-	-	-	-	2250J	2280	-	-	-	-	-	-	-	1680J	2040	1400
Silver	35	MEG	-	-	-	-	<15	<15	-	-	-	-	-	-	-	<15	<15	<15
Sodium	20000	MEG	-	-	-	-	12000	12400	-	-	-	-	-	-	-	6930J	14600	12200
Vanadium	180	RSL	-	-	-	-	1.3J	<2.6U	-	-	-	-	-	-	-	<25	<25	<0.61U
Zinc	2000	MEG	-	-	-	-	<5U	<34.3U	-	-	-	-	-	-	-	<5.5UJ	<24.8U	<10.5U
Dissolved Inorganic Analytes (ug/l)																		
Arsenic	10	MCL	<8.0U	11.6	<8.0	<8.0	<8	<8.0	-	-	-	-	-	-	-	-	-	-
Barium	2000	MCL	-	-	-	-	0.93J	3.4J	-	-	-	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	<10	<10	-	-	-	-	-	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	7410	8820	-	-	-	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	<30	<30	-	-	-	-	-	-	-	-	-	-
Iron	26000	RSL	<100	17100J	6.1U	<100	<29.9U	<114U	-	-	-	-	-	-	-	-	-	-
Lead	10	MEG	-	-	-	-	2J	<6.1U	-	-	-	-	-	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	7030	7110	-	-	-	-	-	-	-	-	-	-
Manganese	200	ICL	1.3	207	2.3J	4.0U	<2.2U	<8.1U	-	-	-	-	-	-	-	-	-	-
Potassium	NA	NA	-	-	-	-	<1980UJ	1930	-	-	-	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	<15	<15	-	-	-	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	11500J	12500	-	-	-	-	-	-	-	-	-	-
Water Quality Analyses (ug/l)																		
Hardness (as CaCO3)	NA	NA	72500	115000	60300	58200	50500	53000	42100	33500J	34200	29300	22800	15200	26800	17300	46100	25000
Residue, filterable	NA	NA	110000	180000	130000	140000J	110000	44000	140000	290000	77000	52000	61000	56000	85000J	48000	91000	52000
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	51300	-	-	-	-	-	-	-	-	-	-

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
MEG = Maine Maximum Exposure Guideline, 2008.
RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_
NA = No standard or benchmark is available for this constituent.
ICL = Interim Cleanup Level from the Record of Decision

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4															
			Northern Boundary Wells															
	GW-Benchmarks	Benchmark Source	MW-95-1R 11/9/2005 Primary	MW-95-1R 6/1/2006 Primary	MW-95-1R 10/30/2006 Primary	MW-95-1R 5/30/2007 Primary	MW-95-1R 10/31/2007 Primary	MW-95-1R 6/18/2008 Primary	MW-95-1R 11/19/2008 Primary	MW-95-1R 6/3/2009 Primary	MW-95-1R 11/4/2009 Primary	MW-95-1S 11/9/2005 Primary	MW-95-1S 6/1/2006 Primary	MW-95-1S 10/30/2006 Primary	MW-95-1S 5/30/2007 Primary	MW-95-1S 10/31/2007 Primary	MW-95-1S 6/18/2008 Primary	MW-95-1S 11/19/2008 Primary
Volatile Organic Compounds (ug/l)																		
Acetone	6,300	MEG	-	-	-	-	-	-	-	<5	<5	-	-	-	-	-	-	-
Benzene	5	MCL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
n-Butylbenzene	NA	NA	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
sec-Butylbenzene	NA	NA	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Chlorobenzene	91	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Chloroethane	21000	RSL	-	-	-	-	-	-	-	<2J	<2	-	-	-	-	-	-	-
2-Chlorotoluene	140	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2-Dichlorobenzene	63	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,3-Dichlorobenzene	60	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Dichlorodifluoromethane	1400	MEG	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-
1,1-Dichloroethane	70	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2-Dichloroethane	4	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2-Dichloroethene	NA	NA	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	70	MCL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,4-Dichlorobenzene	21	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Ethylbenzene	70	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Hexachlorobutadiene	4	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Isopropylbenzene	680	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
4-Isopropyltoluene	NA	NA	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Naphthalene	14	MEG	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1-Phenylpropane	NA	NA	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Tetrahydrofuran	70	MEG	-	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-
Toluene	1000	MCL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	29	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	70	MCL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	15	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	370	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
m&p-Xylene	1200	RSL	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-
o-Xylene	1200	RSL	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-
Total xylenes	1400	MEG	-	-	-	-	-	-	-	<3	<3	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (ug/l)																		
bis(2-Ethylhexyl) phthalate	6	MCL	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-
Diethylphthalate	29000	RSL	-	-	-	-	-	-	-	<10	-	-	-	-	-	-	-	-

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4															
			Northern Boundary Wells															
	GW-Benchmarks	Benchmark Source	MW-95-1R 11/9/2005 Primary	MW-95-1R 6/1/2006 Primary	MW-95-1R 10/30/2006 Primary	MW-95-1R 5/30/2007 Primary	MW-95-1R 10/31/2007 Primary	MW-95-1R 6/18/2008 Primary	MW-95-1R 11/19/2008 Primary	MW-95-1R 6/3/2009 Primary	MW-95-1R 11/4/2009 Primary	MW-95-1S 11/9/2005 Primary	MW-95-1S 6/1/2006 Primary	MW-95-1S 10/30/2006 Primary	MW-95-1S 5/30/2007 Primary	MW-95-1S 10/31/2007 Primary	MW-95-1S 6/18/2008 Primary	MW-95-1S 11/19/2008 Primary
Total Inorganic Analytes (ug/l)																		
Aluminum	1430	MEG	-	-	-	-	-	-	-	<95.1U	<25.8U	-	-	-	-	-	-	-
Arsenic	10	MCL	139	111J	155	118	162	119	141	114	148	1020	891J	971	821	665	759	947
Barium	2000	MCL	-	-	-	-	-	-	-	18.7	28	-	-	-	-	-	-	-
Beryllium	4	MCL	-	-	-	-	-	-	-	<5	<5.0	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	-	-	<0.25U	<10	-	-	-	-	-	-	-
Calcium	NA	NA	47100	30000J	46000	30900	52000	31800	36000	24500	36200	24800	31800J	20800	27600	21000	21400	22000
Chromium	40	MEG	-	-	-	-	-	-	-	<15	2.3	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	-	-	12.9J	18.5J	-	-	-	-	-	-	-
Copper	1300	MCL	-	-	-	-	-	-	-	<9.3UJ	<25	-	-	-	-	-	-	-
Iron	26,000	RSL	28200	16000	25100	16400	29100J	18600	20200	15000	20800	54900	72900	42000	62000	41200J	50100	50100
Lead	10	MEG	-	-	-	-	-	-	-	2.5J	<4.4U	-	-	-	-	-	-	-
Magnesium	NA	NA	4170	2420J	3480	2610	4660	2390	2940	2320	2700	4700	5940J	3590	5440	3770	3790	4340
Manganese	200	ICL	18200	9520	14600	9870	16600	10200	11200	7580	10700	3460	4290	2630	3760	2680	3060	3250
Nickel	140	MEG	-	-	-	-	-	-	-	7.6J	10.9J	-	-	-	-	-	-	-
Potassium	NA	NA	-	-	-	-	-	-	-	1510J	1300	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	-	-	1J	<0.91U	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	-	-	1970J	2480	-	-	-	-	-	-	-
Vanadium	180	RSL	-	-	-	-	-	-	-	<25	<25	-	-	-	-	-	-	-
Zinc	2000	MEG	-	-	-	-	-	-	-	<5.4UJ	<23.1U	-	-	-	-	-	-	-
Dissolved Inorganic Analytes (ug/l)																		
Arsenic	10	MCL	-	-	-	-	-	-	-	-	-	-	-	794	762	-	-	-
Barium	2000	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	26000	RSL	-	-	-	-	-	-	-	-	-	-	-	38800	61300	-	-	-
Lead	10	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	200	ICL	-	-	-	-	-	-	-	-	-	-	-	2610	3770	-	-	-
Potassium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Quality Analyses (ug/l)																		
Hardness (as CaCO3)	NA	NA	135000	84800J	129000	88000	149000	89400	102000	70800	102000	81300	104000J	66700	91400	68000	69100	72700
Residue, filterable	NA	NA	270000	100000	200000	76000	210000	140000	200000J	94000	100000	220000	100000	120000	76000	120000	140000	190000J
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
MEG = Maine Maximum Exposure Guideline, 2008.
RSL – EPA Regional Screening Level (RSL) for Tapwater, December 2009. From:
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_
NA = No standard or benchmark is available for this constituent.
ICL = Interim Cleanup Level from the Record of Decision

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4															
			Northern Boundary Wells (cont.)											Eastern Boundary Wells				
	GW-Benchmarks	Benchmark Source	MW-95-1S 6/3/2009 Primary	MW-95-1S 11/4/2009 Primary	MW-95-3R 11/9/2005 Primary	MW-95-3R 6/1/2006 Primary	MW-95-3R 10/30/2006 Primary	MW-95-3R 5/30/2007 Primary	MW-95-3R 10/31/2007 Primary	MW-95-3R 6/18/2008 Primary	MW-95-3R 11/20/2008 Primary	MW-95-3R 6/3/2009 Primary	MW-95-3R 11/5/2009 Primary	MW-95-4R 11/9/2005 Primary	MW-95-4R 6/1/2006 Primary	MW-95-4R 10/30/2006 Primary	MW-95-4R 5/31/2007 Primary	MW-95-4R 11/1/2007 Primary
Volatile Organic Compounds (ug/l)																		
Acetone	6,300	MEG	<5	<5	<5J	<5J	<5J	<5	<5	3J	<5	<5	<5	<5J	<5JUJ	<5J	<5	<5
Benzene	5	MCL	<1	<1	2	2	2	2	2	2	2	2	2	7	6	7	5	6
n-Butylbenzene	NA	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1JU	<1	<1	<1	<1
sec-Butylbenzene	NA	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	91	RSL	<1	<1	3	2	2	2	2	2	2	2	2	6	6	7	6	6
Chloroethane	21000	RSL	<2J	<2	6	5	4	3	4	3	3	4J	2	8	6	4	3	8J
2-Chlorotoluene	140	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.6J	<1	0.4J	<1	<1
1,2-Dichlorobenzene	63	MEG	<1	<1	2J	2	2	1	2	1	2	1	1	5	3	4	3	4
1,3-Dichlorobenzene	60	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	1400	MEG	<2	<2	<2	<2	<2	<2	<2J	<2	<2	<2	<2	<2	0.5J	<2	<2	<2
1,1-Dichloroethane	70	MEG	<1	<1	4	4	6	5	5	5	4	4	3	<1	<1	<1	<1	<1
1,2-Dichloroethane	4	MEG	<1	<1	<1	0.7J	1	0.8J	1J	0.8J	0.7J	<1	0.6J	<1	<1	<1	<1	<1J
1,2-Dichloroethene	NA	NA	<2	<2	<2	<2	<2	<2	<2	0.3J	<2	0.4J	0.2J	<2	<2	<2	<2	<2
cis-1,2-Dichloroethene	70	MCL	<1	<1	<1	<1	<1	<1	<1	0.3J	<1	0.4J	0.2J	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	21	MEG	<1	<1	<1	1	1	<1	1	1.0J	1	0.9J	<1	3	3	4	2	3
Ethylbenzene	70	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	0.6J	<1	<1
Hexachlorobutadiene	4	MEG	<1	<1	<1J	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Isopropylbenzene	680	RSL	<1	<1	<1	0.5J	<1	0.4J	0.6J	0.6J	0.6J	0.6J	0.5J	2	2	2	1	2
4-Isopropyltoluene	NA	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Naphthalene	14	MEG	<1	<1	<1	<1J	<1	<1	<1	<1	<1	<1	<1	9	2J	6	1	<1
1-Phenylpropane	NA	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	0.6J	<1	0.6J	1
Tetrahydrofuran	70	MEG	<10	<10	<10	<10	<10J	<10J	5J	4J	4J	<10	3J	26	12J	25J	4J	12J
Toluene	1000	MCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.9J	<1	0.6J	<1	0.4J
1,2,3-Trichlorobenzene	29	RSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	70	MCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	15	RSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	3	0.5J	0.8J	<1	1.0J
1,3,5-Trimethylbenzene	370	RSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
m&p-Xylene	1200	RSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	<2	1J	<2	<2
o-Xylene	1200	RSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	0.6J	<1	0.6J
Total xylenes	1400	MEG	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	3	<3	2J	<3	0.6J
Semi-Volatile Organic Compounds (ug/l)																		
bis(2-Ethylhexyl) phthalate	6	MCL	4J	-	-	-	-	-	-	-	-	<9	-	-	-	-	-	-
Diethylphthalate	29000	RSL	<9	-	-	-	-	-	-	-	-	<9	-	-	-	-	-	-

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4																
			Northern Boundary Wells (cont.)											Eastern Boundary Wells				
	GW-Benchmarks	Benchmark Source	MW-95-1S 6/3/2009 Primary	MW-95-1S 11/4/2009 Primary	MW-95-3R 11/9/2005 Primary	MW-95-3R 6/1/2006 Primary	MW-95-3R 10/30/2006 Primary	MW-95-3R 5/30/2007 Primary	MW-95-3R 10/31/2007 Primary	MW-95-3R 6/18/2008 Primary	MW-95-3R 11/20/2008 Primary	MW-95-3R 6/3/2009 Primary	MW-95-3R 11/5/2009 Primary	MW-95-4R 11/9/2005 Primary	MW-95-4R 6/1/2006 Primary	MW-95-4R 10/30/2006 Primary	MW-95-4R 5/31/2007 Primary	MW-95-4R 11/1/2007 Primary
Total Inorganic Analytes (ug/l)																			
Aluminum	1430	MEG	<71.4U	<28.3U	-	-	-	-	-	-	-	<246U	<36.8U	-	-	-	-	-	
Arsenic	10	MCL	754	1030	596	592J	620	602	593	587	645	609	564	376	470J	460	426	516	
Barium	2000	MCL	10.3J	12.4	-	-	-	-	-	-	-	125	121	-	-	-	-	-	
Beryllium	4	MCL	<5	<5.0	-	-	-	-	-	-	-	<5	<5.0	-	-	-	-	-	
Cadmium	3.5	MEG	0.76J	<10	-	-	-	-	-	-	-	0.84J	<10	-	-	-	-	-	
Calcium	NA	NA	19200	16300	117000	121000J	127000	108000	110000	104000	115000	99200	104000	72400	76500J	80200	67900	74400	
Chromium	40	MEG	<15	<0.93U	-	-	-	-	-	-	-	<4.9U	6.0J	-	-	-	-	-	
Cobalt	11	RSL	16.1J	11.5J	-	-	-	-	-	-	-	22.3J	14.9J	-	-	-	-	-	
Copper	1300	MCL	<25J	<25	-	-	-	-	-	-	-	<9.3UJ	<25	-	-	-	-	-	
Iron	26,000	RSL	47100	40700	66100	73700	82400	62500	62600J	59200	62300	63300	62200	21400	26800	24700	26600	25500J	
Lead	10	MEG	<5	<2.7U	-	-	-	-	-	-	-	3.1J	<5.0	-	-	-	-	-	
Magnesium	NA	NA	4530	2990	22200	22200J	24300	19900	23200	19400	21000	19600	19100	31200	27700J	31800	24100	33500	
Manganese	200	ICL	2920	2390	2550	2840	2700	2320	1890	2070	2410	2030	1650	1180	1530	1360	1520	1220	
Nickel	140	MEG	<40	<40	-	-	-	-	-	-	-	20.9J	16.8J	-	-	-	-	-	
Potassium	NA	NA	7700J	7720	-	-	-	-	-	-	-	13300J	12800	-	-	-	-	-	
Silver	35	MEG	<15	<15	-	-	-	-	-	-	-	0.65J	<0.75U	-	-	-	-	-	
Sodium	20000	MEG	3260J	3120	-	-	-	-	-	-	-	31800J	39200	-	-	-	-	-	
Vanadium	180	RSL	<25	<25	-	-	-	-	-	-	-	<25	<25	-	-	-	-	-	
Zinc	2000	MEG	<3UJ	<28.0U	-	-	-	-	-	-	-	<5.4UJ	<11.9U	-	-	-	-	-	
Dissolved Inorganic Analytes (ug/l)																			
Arsenic	10	MCL	-	706	-	-	613	-	-	-	-	-	-	-	-	-	-	-	
Barium	2000	MCL	-	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cadmium	3.5	MEG	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Calcium	NA	NA	-	16600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cobalt	11	RSL	-	11.4J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Iron	26000	RSL	-	33600	-	-	67900	-	-	-	-	-	-	-	-	-	-	-	
Lead	10	MEG	-	<1.6U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Magnesium	NA	NA	-	3100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	200	ICL	-	2440	-	-	2350	-	-	-	-	-	-	-	-	-	-	-	
Potassium	NA	NA	-	7810	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silver	35	MEG	-	<0.68U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sodium	20000	MEG	-	3210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Water Quality Analyses (ug/l)																			
Hardness (as CaCO3)	NA	NA	66600	53000	383000	394000J	416000	351000	369000	338000	374000	328000	340000	309000	305000J	331000	269000	324000	
Residue, filterable	NA	NA	160000	<10000	580000	1000000	600000	470000	470000	590000	460000J	500000	340000	740000	1200000	840000	650000	680000	
Dissolved Hardness (as CaCO3)	NA	NA	-	54100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
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RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_
NA = No standard or benchmark is available for this constituent.
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(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4														
			Eastern Boundary Wells (cont.)														
	GW-Benchmarks	Benchmark Source	MW-95-4R 6/19/2008 Primary	MW-95-4R 11/20/2008 Primary	MW-95-4R 6/4/2009 Primary	MW-95-4R 11/5/2009 Primary	MW-95-4RD 11/10/2005 Primary	MW-95-4RD 6/1/2006 Primary	MW-95-4RD 10/30/2006 Primary	MW-95-4RD 5/31/2007 Primary	MW-95-4RD 11/1/2007 Primary	MW-95-4RD 6/19/2008 Primary	MW-95-4RD 11/20/2008 Primary	MW-95-4RD 6/4/2009 Primary	MW-95-4RD 11/5/2009 Primary	MW-95-4SA 11/9/2005 Primary	MW-95-4SA 6/1/2006 Primary
Volatile Organic Compounds (ug/l)																	
Acetone	6,300	MEG	6	<5	<5	<5JU	<5J	<5J	<5J	<5	<5	4J	<5	<5JU	<5JU	-	-
Benzene	5	MCL	4	4J	4J	4	8	5	8	5	<1	4	3	3	4	-	-
n-Butylbenzene	NA	NA	0.3J	0.3J	0.4J	0.4J	0.5J	<1	<1	<1	<1	0.2J	0.3J	0.3J	0.3J	-	-
sec-Butylbenzene	NA	NA	<1	<1	<1	0.2J	<1	<1	<1	<1	<1	<1	<1	<1	0.2J	-	-
Chlorobenzene	91	RSL	5	4	4J	4	8	6	8	6	<1	5	4	5	5	-	-
Chloroethane	21000	RSL	2	2	<2J	2	8	5	5	4	<2J	3	<2	<2J	2	-	-
2-Chlorotoluene	140	MEG	<1	<1	<1	<1	<1	<1	0.4J	<1	<1	<1	<1	<1	<1	-	-
1,2-Dichlorobenzene	63	MEG	2	2	3J	2	5	3	5	3	<1	3	2	2	2	-	-
1,3-Dichlorobenzene	60	MEG	<1	<1	<1	<1	<1	<1	4	<1	<1	<1	<1	<1	<1	-	-
Dichlorodifluoromethane	1400	MEG	<2	<2	<2	<2	<2	0.4J	<2	<2	<2	<2	<2	<2	<2	-	-
1,1-Dichloroethane	70	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
1,2-Dichloroethane	4	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1J	<1	<1	<1	<1	-	-
1,2-Dichloroethene	NA	NA	<2	<2	0.3J	0.2J	<2	<2	<2	<2	<2	<2	<2	0.3J	0.2J	-	-
cis-1,2-Dichloroethene	70	MCL	<1	<1	0.3J	0.2J	0.3J	<1	<1	<1	<1	<1	<1	0.3J	0.2J	-	-
1,4-Dichlorobenzene	21	MEG	3	2	3J	2	5	3	4	2	<1	3	2	3	3	-	-
Ethylbenzene	70	MEG	<1	<1	<1	<1	2	<1	0.6J	<1	<1	<1	<1	<1	<1	-	-
Hexachlorobutadiene	4	MEG	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
Isopropylbenzene	680	RSL	1	2	2	1	2	2	2	1	<1	1	2	1	1	-	-
4-Isopropyltoluene	NA	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
Naphthalene	14	MEG	0.7J	<1	3J	1	6	3J	6	1	<1	0.6J	<1	3	1	-	-
1-Phenylpropane	NA	NA	0.5J	0.7J	0.7J	0.7J	<1	0.7J	<1J	0.5J	<1	0.5J	0.7J	0.5J	0.7J	-	-
Tetrahydrofuran	70	MEG	4J	6J	<10	4J	34	16J	26J	6J	<10J	5J	6J	<10	4J	-	-
Toluene	1000	MCL	<1	<1	<1	0.3J	<1	<1	0.6J	<1	<1	<1	<1	<1	0.3J	-	-
1,2,3-Trichlorobenzene	29	RSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
1,2,4-Trichlorobenzene	70	MCL	<1	<1	<1	<1	<1	<1	0.7J	<1	<1	<1	<1	<1	<1	-	-
1,2,4-Trimethylbenzene	15	RSL	<1	0.3J	<1	<1	4	0.5J	1	0.3J	<1	<1	0.3J	0.3J	<1	-	-
1,3,5-Trimethylbenzene	370	RSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
m&p-Xylene	1200	RSL	<2	<2	<2	<2	<2	<2	1J	<2	<2	<2	<2	<2	<2	-	-
o-Xylene	1200	RSL	<1	<1	<1	<1	0.3J	<1	0.6J	<1	<1	<1	<1	<1	<1	-	-
Total xylenes	1400	MEG	<3	<3	<3	<3	<3	<3	2J	<3	<3	<3	<3	<3	<3	-	-
Semi-Volatile Organic Compounds (ug/l)																	
bis(2-Ethylhexyl) phthalate	6	MCL	-	-	<10	-	-	-	-	-	-	-	-	<9	-	-	-
Diethylphthalate	29000	RSL	-	-	1J	-	-	-	-	-	-	-	-	<9	-	-	-

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4														
			Eastern Boundary Wells (cont.)														
	GW-Benchmarks	Benchmark Source	MW-95-4R 6/19/2008 Primary	MW-95-4R 11/20/2008 Primary	MW-95-4R 6/4/2009 Primary	MW-95-4R 11/5/2009 Primary	MW-95-4RD 11/10/2005 Primary	MW-95-4RD 6/1/2006 Primary	MW-95-4RD 10/30/2006 Primary	MW-95-4RD 5/31/2007 Primary	MW-95-4RD 11/1/2007 Primary	MW-95-4RD 6/19/2008 Primary	MW-95-4RD 11/20/2008 Primary	MW-95-4RD 6/4/2009 Primary	MW-95-4RD 11/5/2009 Primary	MW-95-4SA 11/9/2005 Primary	MW-95-4SA 6/1/2006 Primary
Total Inorganic Analytes (ug/l)																	
Aluminum	1430	MEG	-	-	<144U	<34.9U	-	-	-	-	-	-	-	<176U	<32.1U	-	-
Arsenic	10	MCL	457	435	433	535	113	374J	547	484	600	549	540	579	622	157	150J
Barium	2000	MCL	-	-	125	142	-	-	-	-	-	-	-	140	160	-	-
Beryllium	4	MCL	-	-	<5	<5.0	-	-	-	-	-	-	-	<5	<5.0	-	-
Cadmium	3.5	MEG	-	-	<0.19U	<10	-	-	-	-	-	-	-	<0.34U	<10	-	-
Calcium	NA	NA	61200	61900	52800	65200	83000	71000J	94400	78000	91200	69000	72700	64000	79400	30300	45900J
Chromium	40	MEG	-	-	<2.3U	3.7J	-	-	-	-	-	-	-	<2.9U	3.8J	-	-
Cobalt	11	RSL	-	-	<30	<30	-	-	-	-	-	-	-	1.7J	<1.3U	-	-
Copper	1300	MCL	-	-	<25UJ	<25	-	-	-	-	-	-	-	<25J	<25	-	-
Iron	26,000	RSL	25500	18200	22800	25000	7590J	23000	30200	27900	29500J	25500	25100	26800	29200	15900	18100
Lead	10	MEG	-	-	2.6J	<5.0	-	-	-	-	-	-	-	2.9J	<5.0	-	-
Magnesium	NA	NA	20700	23100	19800	22200	26400	26100J	35800	26900	37600	22800	25800	21900	23500	8410	12400J
Manganese	200	ICL	1510	1170	1410	1480	3030J	1360	1670	1620	1650	1540	1650	1620	1780	2950	3640
Nickel	140	MEG	-	-	13.5J	19.5J	-	-	-	-	-	-	-	16.8J	20.2J	-	-
Potassium	NA	NA	-	-	26600J	29900	-	-	-	-	-	-	-	27200J	28200	-	-
Silver	35	MEG	-	-	<15	<15	-	-	-	-	-	-	-	<15	<15	-	-
Sodium	20000	MEG	-	-	76300J	90300	-	-	-	-	-	-	-	89600J	97200	-	-
Vanadium	180	RSL	-	-	<25	<0.95U	-	-	-	-	-	-	-	<25	<0.79U	-	-
Zinc	2000	MEG	-	-	<1.1UJ	<15.1U	-	-	-	-	-	-	-	<4.4UJ	<17.0U	-	-
Dissolved Inorganic Analytes (ug/l)																	
Arsenic	10	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	2000	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	26000	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	10	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	200	ICL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Quality Analyses (ug/l)																	
Hardness (as CaCO3)	NA	NA	238000	250000	213000	254000	316000	285000J	383000	305000	383000	266000	288000	250000	295000	110000	166000J
Residue, filterable	NA	NA	510000	660000J	480000	540000	960000	680000	880000	630000	850000	610000	950000J	510000	620000	220000	700000
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
MEG = Maine Maximum Exposure Guideline, 2008.
RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From:
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_
NA = No standard or benchmark is available for this constituent.
ICL = Interim Cleanup Level from the Record of Decision

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4														
			Eastern Boundary Wells (cont.)														
	GW-Benchmarks	Benchmark Source	MW-95-4SA 10/31/2006 Primary	MW-95-4SA 5/30/2007 Primary	MW-95-4SA 11/1/2007 Primary	MW-95-4SA 6/19/2008 Primary	MW-95-4SA 11/19/2008 Primary	MW-95-4SA 6/4/2009 Primary	MW-95-4SA 11/5/2009 Primary	MW-95-4SB 11/9/2005 Primary	MW-95-4SB 6/1/2006 Primary	MW-95-4SB 10/31/2006 Primary	MW-95-4SB 5/30/2007 Primary	MW-95-4SB 11/1/2007 Primary	MW-95-4SB 6/19/2008 Primary	MW-95-4SB 11/19/2008 Primary
Volatile Organic Compounds (ug/l)																	
Acetone	6,300	MEG	-	-	-	-	-	<5	<5	-	-	-	-	-	-	-	
Benzene	5	MCL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
n-Butylbenzene	NA	NA	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
sec-Butylbenzene	NA	NA	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
Chlorobenzene	91	RSL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
Chloroethane	21000	RSL	-	-	-	-	-	<2J	<2	-	-	-	-	-	-	-	
2-Chlorotoluene	140	MEG	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
1,2-Dichlorobenzene	63	MEG	-	-	-	-	-	<1	0.2J	-	-	-	-	-	-	-	
1,3-Dichlorobenzene	60	MEG	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
Dichlorodifluoromethane	1400	MEG	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-	
1,1-Dichloroethane	70	MEG	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
1,2-Dichloroethane	4	MEG	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
1,2-Dichloroethene	NA	NA	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-	
cis-1,2-Dichloroethene	70	MCL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
1,4-Dichlorobenzene	21	MEG	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
Ethylbenzene	70	MEG	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
Hexachlorobutadiene	4	MEG	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
Isopropylbenzene	680	RSL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
4-Isopropyltoluene	NA	NA	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
Naphthalene	14	MEG	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
1-Phenylpropane	NA	NA	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
Tetrahydrofuran	70	MEG	-	-	-	-	-	<10	2J	-	-	-	-	-	-	-	
Toluene	1000	MCL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
1,2,3-Trichlorobenzene	29	RSL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
1,2,4-Trichlorobenzene	70	MCL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
1,2,4-Trimethylbenzene	15	RSL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
1,3,5-Trimethylbenzene	370	RSL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
m&p-Xylene	1200	RSL	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-	
o-Xylene	1200	RSL	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	
Total xylenes	1400	MEG	-	-	-	-	-	<3	<3	-	-	-	-	-	-	-	
Semi-Volatile Organic Compounds (ug/l)																	
bis(2-Ethylhexyl) phthalate	6	MCL	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	
Diethylphthalate	29000	RSL	-	-	-	-	-	<10	-	-	-	-	-	-	-	-	

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4													
			Eastern Boundary Wells (cont.)													
	GW-Benchmarks	Benchmark Source	MW-95-4SA 10/31/2006 Primary	MW-95-4SA 5/30/2007 Primary	MW-95-4SA 11/1/2007 Primary	MW-95-4SA 6/19/2008 Primary	MW-95-4SA 11/19/2008 Primary	MW-95-4SA 6/4/2009 Primary	MW-95-4SA 11/5/2009 Primary	MW-95-4SB 11/9/2005 Primary	MW-95-4SB 6/1/2006 Primary	MW-95-4SB 10/31/2006 Primary	MW-95-4SB 5/30/2007 Primary	MW-95-4SB 11/1/2007 Primary	MW-95-4SB 6/19/2008 Primary	MW-95-4SB 11/19/2008 Primary
Total Inorganic Analytes (ug/l)																
Aluminum	1430	MEG	-	-	-	-	-	<104U	<300	-	-	-	-	-	-	-
Arsenic	10	MCL	148	143	178	145	154	111	166	83	98.8J	88.6	4680	89.2	65.6	87.2
Barium	2000	MCL	-	-	-	-	-	58	77	-	-	-	-	-	-	-
Beryllium	4	MCL	-	-	-	-	-	<5	<5.0	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	<0.16U	<10	-	-	-	-	-	-	-
Calcium	NA	NA	43900	47000	62100	36400	34800	32500	47600	45200	62100J	54000	62600	57600	53900	62800
Chromium	40	MEG	-	-	-	-	-	<15	<1.4U	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	4.8J	6.5J	-	-	-	-	-	-	-
Copper	1300	MCL	-	-	-	-	-	<5.8UJ	<25	-	-	-	-	-	-	-
Iron	26,000	RSL	16900	16600	23700J	11700	11400	9930	14700	7850	12300	7900	285000	7220J	6760	6430
Lead	10	MEG	-	-	-	-	-	2J	<2.5U	-	-	-	-	-	-	-
Magnesium	NA	NA	11900	13600	19100	10600	9830	9990	11600	12900	16800J	13900	14100	16200	13900	15900
Manganese	200	ICL	3420	3530	4930	2060	2320	2170	2880	4570	5520	3920	5780	3980	3520	3780
Nickel	140	MEG	-	-	-	-	-	<3.3U	3.6J	-	-	-	-	-	-	-
Potassium	NA	NA	-	-	-	-	-	6660J	7290	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	<15	0.69J	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	20500J	19200	-	-	-	-	-	-	-
Vanadium	180	RSL	-	-	-	-	-	<25	<25	-	-	-	-	-	-	-
Zinc	2000	MEG	-	-	-	-	-	<4.6UJ	<8.0U	-	-	-	-	-	-	-
Dissolved Inorganic Analytes (ug/l)																
Arsenic	10	MCL	-	-	-	-	-	-	-	-	-	-	44.1	-	-	-
Barium	2000	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	26000	RSL	-	-	-	-	-	-	-	-	-	-	8310	-	-	-
Lead	10	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	200	ICL	-	-	-	-	-	-	-	-	-	-	4720	-	-	-
Potassium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Quality Analyses (ug/l)																
Hardness (as CaCO3)	NA	NA	159000	173000	234000	135000	127000	122000	166000	166000	224000J	192000	214000	211000	192000	222000
Residue, filterable	NA	NA	280000	230000	380000	240000	240000J	210000	260000	340000	360000	330000	300000	340000	280000	360000J
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
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Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
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RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From:
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_
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Saco, Maine

			Landfill Areas 3 & 4															
			Eastern Boundary Wells (cont.)															
	GW-Benchmarks	Benchmark Source	MW-95-4SB 6/4/2009 Primary	MW-95-4SB 11/5/2009 Primary	MW-95-6R 6/2/2009 Primary	MW-95-6S 11/10/2005 Primary	MW-95-6S 5/31/2006 Primary	MW-95-6S 10/30/2006 Primary	MW-95-6S 5/31/2007 Primary	MW-95-6S 11/1/2007 Primary	MW-95-6S 6/19/2008 Primary	MW-95-6S 11/19/2008 Primary	MW-95-6S 6/2/2009 Primary	MW-95-6S 11/4/2009 Primary	MW-97-13R 11/10/2005 Primary	MW-97-13R 6/1/2006 Primary	MW-97-13R 10/30/2006 Primary	MW-97-13R 5/30/2007 Primary
Volatile Organic Compounds (ug/l)																		
Acetone	6,300	MEG	<5	<5JU	<5	-	-	-	-	-	-	-	<5	<5	<5J	<5J	<5J	4J
Benzene	5	MCL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	2	2	2	1
n-Butylbenzene	NA	NA	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	NA	NA	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
Chlorobenzene	91	RSL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	0.3J	0.3J
Chloroethane	21000	RSL	<2J	<2	<2	-	-	-	-	-	-	-	<2	<2	<2	<2	<2	<2
2-Chlorotoluene	140	MEG	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	63	MEG	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	60	MEG	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	1400	MEG	<2	<2	<2	-	-	-	-	-	-	-	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	70	MEG	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	4	MEG	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
1,2-Dichloroethene	NA	NA	<2	<2	<2	-	-	-	-	-	-	-	<2	<2	<2	<2	<2	<2
cis-1,2-Dichloroethene	70	MCL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	21	MEG	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
Ethylbenzene	70	MEG	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	4	MEG	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
Isopropylbenzene	680	RSL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
4-Isopropyltoluene	NA	NA	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	0.3J	<1	<1	<1
Naphthalene	14	MEG	<1	<1	<1	-	-	-	-	-	-	-	<1	<1UJ	<1	<1J	<1	<1
1-Phenylpropane	NA	NA	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
Tetrahydrofuran	70	MEG	<10	3J	<10	-	-	-	-	-	-	-	<10	<10	<10	<10J	<10J	<10J
Toluene	1000	MCL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	29	RSL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	70	MCL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	15	RSL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	370	RSL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
m&p-Xylene	1200	RSL	<2	<2	<2	-	-	-	-	-	-	-	<2	<2	<2	<2	<2	<2
o-Xylene	1200	RSL	<1	<1	<1	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1
Total xylenes	1400	MEG	<3	<3	<3	-	-	-	-	-	-	-	<3	<3	<3	<3	<3	<3
Semi-Volatile Organic Compounds (ug/l)																		
bis(2-Ethylhexyl) phthalate	6	MCL	2J	-	<10	-	-	-	-	-	-	-	<9	-	-	-	-	-
Diethylphthalate	29000	RSL	<9	-	<10	-	-	-	-	-	-	-	<9	-	-	-	-	-

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4															
			Eastern Boundary Wells (cont.)															
	GW-Benchmarks	Benchmark Source	MW-95-4SB 6/4/2009 Primary	MW-95-4SB 11/5/2009 Primary	MW-95-6R 6/2/2009 Primary	MW-95-6S 11/10/2005 Primary	MW-95-6S 5/31/2006 Primary	MW-95-6S 10/30/2006 Primary	MW-95-6S 5/31/2007 Primary	MW-95-6S 11/1/2007 Primary	MW-95-6S 6/19/2008 Primary	MW-95-6S 11/19/2008 Primary	MW-95-6S 6/2/2009 Primary	MW-95-6S 11/4/2009 Primary	MW-97-13R 11/10/2005 Primary	MW-97-13R 6/1/2006 Primary	MW-97-13R 10/30/2006 Primary	MW-97-13R 5/30/2007 Primary
Total Inorganic Analytes (ug/l)																		
Aluminum	1430	MEG	<127U	<23.4U	95.3J	-	-	-	-	-	-	-	92.7J	<26.0U	-	-	-	-
Arsenic	10	MCL	74	79.9	3.8	5.2	9.4J	9.8	<8.0U	<8.2U	2.5J	<5.1U	<8	<3.1U	81.1	138J	148	238
Barium	2000	MCL	41.9	55.5	8.9J	-	-	-	-	-	-	-	9.5J	11.6	-	-	-	-
Beryllium	4	MCL	<5	<5.0	<5	-	-	-	-	-	-	-	<5	<5.0	-	-	-	-
Cadmium	3.5	MEG	<0.09U	<10	<10	-	-	-	-	-	-	-	<10	<10	-	-	-	-
Calcium	NA	NA	48900	69700	43000	29000	41700J	29500	35300	28500	28200	31000	29100	32200	45100	32800J	34500	36300
Chromium	40	MEG	<0.88U	<1.5U	<15	-	-	-	-	-	-	-	<15	<0.56U	-	-	-	-
Cobalt	11	RSL	2.5J	3.5J	<30	-	-	-	-	-	-	-	<30	<30	-	-	-	-
Copper	1300	MCL	<5.1UJ	<25	<25	-	-	-	-	-	-	-	<25	<25	-	-	-	-
Iron	26,000	RSL	6400	6600	8.4J	2940	7850	3750	2080	1880J	986	1440	726	1600	195000J	185000	182000	158000
Lead	10	MEG	1.7J	<1.6U	<5	-	-	-	-	-	-	-	<5	<5.0	-	-	-	-
Magnesium	NA	NA	13500	15600	10400	6850	10700J	7180	8530	7220	6830	7910	8390	7820	9600	7270J	6660	7210
Manganese	200	ICL	2980	3680	<5	159	245	140	246	121	138	116	239	145	4920J	4430	4220	4040
Nickel	140	MEG	<3.6U	4.6J	<40	-	-	-	-	-	-	-	<40	<40	-	-	-	-
Potassium	NA	NA	10200J	12100	3810	-	-	-	-	-	-	-	3020	2810	-	-	-	-
Silver	35	MEG	<15	<15	<15	-	-	-	-	-	-	-	<15	<15	-	-	-	-
Sodium	20000	MEG	30200J	42600	14200	-	-	-	-	-	-	-	8130	8680	-	-	-	-
Vanadium	180	RSL	<25	<25	<25	-	-	-	-	-	-	-	<25	<25	-	-	-	-
Zinc	2000	MEG	<4UJ	<6.0U	3.6J	-	-	-	-	-	-	-	3.5J	<2.5U	-	-	-	-
Dissolved Inorganic Analytes (ug/l)																		
Arsenic	10	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	2000	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	26000	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	10	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	200	ICL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Quality Analyses (ug/l)																		
Hardness (as CaCO3)	NA	NA	178000	238000	150000	100000	148000J	103000	123000	101000	98600	110000	107000	112000	152000	112000J	114000	120000
Residue, filterable	NA	NA	270000	360000	210000	130000	390000	130000	120000	110000	130000	120000J	130000	130000	430000	330000	<20000	260000
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
MEG = Maine Maximum Exposure Guideline, 2008.
RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From:
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_
NA = No standard or benchmark is available for this constituent.
ICL = Interim Cleanup Level from the Record of Decision

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4													
			Eastern Boundary Wells (cont.)													
	GW-Benchmarks	Benchmark Source	MW-97-13R 11/1/2007 Primary	MW-97-13R 6/19/2008 Primary	MW-97-13R 11/20/2008 Primary	MW-97-13R 6/4/2009 Primary	MW-97-13R 11/5/2009 Primary	MW-97-14S-1 11/10/2005 Primary	MW-97-14S-1 5/31/2006 Primary	MW-97-14S-1 10/30/2006 Primary	MW-97-14S-1 5/31/2007 Primary	MW-97-14S-1 11/1/2007 Primary	MW-97-14S-1 6/19/2008 Primary	MW-97-14S-1 11/20/2008 Primary	MW-97-14S-1 6/4/2009 Primary	MW-97-14S-1 11/4/2009 Primary
Volatile Organic Compounds (ug/l)																
Acetone	6,300	MEG	<5	<5	<5	<5	<5	-	-	-	-	-	-	-	<5	<5
Benzene	5	MCL	1	1	1	0.8J	0.4J	-	-	-	-	-	-	-	<1	<1
n-Butylbenzene	NA	NA	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
sec-Butylbenzene	NA	NA	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
Chlorobenzene	91	RSL	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
Chloroethane	21000	RSL	<2J	<2	<2	<2	<2UJ	-	-	-	-	-	-	-	<2	<2
2-Chlorotoluene	140	MEG	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1,2-Dichlorobenzene	63	MEG	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1,3-Dichlorobenzene	60	MEG	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
Dichlorodifluoromethane	1400	MEG	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	<2	<2
1,1-Dichloroethane	70	MEG	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1,2-Dichloroethane	4	MEG	<1J	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1,2-Dichloroethene	NA	NA	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	<2	<2
cis-1,2-Dichloroethene	70	MCL	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1,4-Dichlorobenzene	21	MEG	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
Ethylbenzene	70	MEG	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
Hexachlorobutadiene	4	MEG	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
Isopropylbenzene	680	RSL	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
4-Isopropyltoluene	NA	NA	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
Naphthalene	14	MEG	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1-Phenylpropane	NA	NA	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
Tetrahydrofuran	70	MEG	<10J	<10	<10	<10	<10	-	-	-	-	-	-	-	<10	3J
Toluene	1000	MCL	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1,2,3-Trichlorobenzene	29	RSL	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1,2,4-Trichlorobenzene	70	MCL	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1,2,4-Trimethylbenzene	15	RSL	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
1,3,5-Trimethylbenzene	370	RSL	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
m&p-Xylene	1200	RSL	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	<2	<2
o-Xylene	1200	RSL	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	<1	<1
Total xylenes	1400	MEG	<3	<3	<3	<3	<3	-	-	-	-	-	-	-	<3	<3
Semi-Volatile Organic Compounds (ug/l)																
bis(2-Ethylhexyl) phthalate	6	MCL	-	-	-	4J	-	-	-	-	-	-	-	-	6J	-
Diethylphthalate	29000	RSL	-	-	-	<9	-	-	-	-	-	-	-	-	<9	-

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4														
			Eastern Boundary Wells (cont.)														
	GW-Benchmarks	Benchmark Source	MW-97-13R 11/1/2007 Primary	MW-97-13R 6/19/2008 Primary	MW-97-13R 11/20/2008 Primary	MW-97-13R 6/4/2009 Primary	MW-97-13R 11/5/2009 Primary	MW-97-14S-1 11/10/2005 Primary	MW-97-14S-1 5/31/2006 Primary	MW-97-14S-1 10/30/2006 Primary	MW-97-14S-1 5/31/2007 Primary	MW-97-14S-1 11/1/2007 Primary	MW-97-14S-1 6/19/2008 Primary	MW-97-14S-1 11/20/2008 Primary	MW-97-14S-1 6/4/2009 Primary	MW-97-14S-1 11/4/2009 Primary
Total Inorganic Analytes (ug/l)																	
Aluminum	1430	MEG	-	-	-	<95.9U	<24.0U	-	-	-	-	-	-	-	<153U	<37.0U	
Arsenic	10	MCL	144	130	244	151	206	186	124J	151	114	166	116	166	109	167	
Barium	2000	MCL	-	-	-	11.2	10.6	-	-	-	-	-	-	-	50.2	67.1	
Beryllium	4	MCL	-	-	-	<5	<5.0	-	-	-	-	-	-	-	<5	<5.0	
Cadmium	3.5	MEG	-	-	-	1.3J	<10	-	-	-	-	-	-	-	<10	<10	
Calcium	NA	NA	32700	23200	24600	19900	16400	63300	48800J	49500	71400	47100	79600	70000	55000	66200	
Chromium	40	MEG	-	-	-	<15	<1.1U	-	-	-	-	-	-	-	<15	<1.7U	
Cobalt	11	RSL	-	-	-	<30	<30	-	-	-	-	-	-	-	0.26J	<0.66U	
Copper	1300	MCL	-	-	-	<25J	<25	-	-	-	-	-	-	-	<25J	<0.84U	
Iron	26,000	RSL	149000J	137000	119000	130000	122000	10000J	6330	5310	7730	5490J	8430	6920	6310	7290	
Lead	10	MEG	-	-	-	1.8J	<5.0	-	-	-	-	-	-	-	<5	<5.0	
Magnesium	NA	NA	6340	4510	5280	4640	3150	16400	12800J	11500	19000	12200	19800	16100	14500	14200	
Manganese	200	ICL	3490	3400	3230	2640	2330	1400J	848	816	1160	846	1400	1180	928	1020	
Nickel	140	MEG	-	-	-	<40	<40	-	-	-	-	-	-	-	<1.6U	<2.2U	
Potassium	NA	NA	-	-	-	5460J	5470	-	-	-	-	-	-	-	11000	15800	
Silver	35	MEG	-	-	-	1.2J	<15	-	-	-	-	-	-	-	<15	<15	
Sodium	20000	MEG	-	-	-	2770J	2450	-	-	-	-	-	-	-	37100	44200	
Vanadium	180	RSL	-	-	-	<25	<25	-	-	-	-	-	-	-	<25	<25	
Zinc	2000	MEG	-	-	-	<0.34UJ	<9.7U	-	-	-	-	-	-	-	<25UJ	<2.6U	
Dissolved Inorganic Analytes (ug/l)																	
Arsenic	10	MCL	-	-	-	125	-	-	-	-	-	-	-	-	-	-	
Barium	2000	MCL	-	-	-	11.5	-	-	-	-	-	-	-	-	-	-	
Cadmium	3.5	MEG	-	-	-	1.3J	-	-	-	-	-	-	-	-	-	-	
Calcium	NA	NA	-	-	-	19800	-	-	-	-	-	-	-	-	-	-	
Cobalt	11	RSL	-	-	-	<30	-	-	-	-	-	-	-	-	-	-	
Iron	26000	RSL	-	-	-	126000	-	-	-	-	-	-	-	-	-	-	
Lead	10	MEG	-	-	-	1.5J	-	-	-	-	-	-	-	-	-	-	
Magnesium	NA	NA	-	-	-	4630	-	-	-	-	-	-	-	-	-	-	
Manganese	200	ICL	-	-	-	2600	-	-	-	-	-	-	-	-	-	-	
Potassium	NA	NA	-	-	-	5260J	-	-	-	-	-	-	-	-	-	-	
Silver	35	MEG	-	-	-	1.2J	-	-	-	-	-	-	-	-	-	-	
Sodium	20000	MEG	-	-	-	2740J	-	-	-	-	-	-	-	-	-	-	
Water Quality Analyses (ug/l)																	
Hardness (as CaCO3)	NA	NA	108000	76600	83200	68700	53800	225000	174000J	171000	256000	168000	280000	241000	197000	224000	
Residue, filterable	NA	NA	330000	290000	630000J	300000	350000	400000	550000	610000	380000	270000	440000	520000J	320000	330000	
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
MEG = Maine Maximum Exposure Guideline, 2008.
RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_
NA = No standard or benchmark is available for this constituent.
ICL = Interim Cleanup Level from the Record of Decision

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4															
			Eastern Boundary Wells (cont.)										Southern Boundary Wells					
	GW-Benchmarks	Benchmark Source	MW-97-16S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-93-5	MW-93-5	MW-93-5	MW-93-5	MW-93-5	MW-93-5
			6/2/2009	11/10/2005	6/1/2006	10/31/2006	5/31/2007	11/1/2007	6/19/2008	11/20/2008	6/2/2009	11/4/2009	11/10/2005	5/31/2006	10/30/2006	5/31/2007	11/1/2007	6/19/2008
			Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds (ug/l)																		
Acetone	6,300	MEG	<5	-	-	-	-	-	-	-	<5	<5	-	-	-	-	-	-
Benzene	5	MCL	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
n-Butylbenzene	NA	NA	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
sec-Butylbenzene	NA	NA	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
Chlorobenzene	91	RSL	<1	-	-	-	-	-	-	-	0.5J	<1	-	-	-	-	-	-
Chloroethane	21000	RSL	<2	-	-	-	-	-	-	-	0.5J	0.7J	-	-	-	-	-	-
2-Chlorotoluene	140	MEG	<1J	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
1,2-Dichlorobenzene	63	MEG	<1	-	-	-	-	-	-	-	<1	0.3J	-	-	-	-	-	-
1,3-Dichlorobenzene	60	MEG	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
Dichlorodifluoromethane	1400	MEG	<2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-
1,1-Dichloroethane	70	MEG	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
1,2-Dichloroethane	4	MEG	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
1,2-Dichloroethene	NA	NA	<2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-
cis-1,2-Dichloroethene	70	MCL	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
1,4-Dichlorobenzene	21	MEG	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
Ethylbenzene	70	MEG	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
Hexachlorobutadiene	4	MEG	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
Isopropylbenzene	680	RSL	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
4-Isopropyltoluene	NA	NA	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
Naphthalene	14	MEG	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
1-Phenylpropane	NA	NA	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
Tetrahydrofuran	70	MEG	<10	-	-	-	-	-	-	-	6J	4J	-	-	-	-	-	-
Toluene	1000	MCL	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
1,2,3-Trichlorobenzene	29	RSL	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
1,2,4-Trichlorobenzene	70	MCL	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
1,2,4-Trimethylbenzene	15	RSL	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
1,3,5-Trimethylbenzene	370	RSL	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
m&p-Xylene	1200	RSL	<2	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-
o-Xylene	1200	RSL	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-
Total xylenes	1400	MEG	<3	-	-	-	-	-	-	-	<3	<3	-	-	-	-	-	-
Semi-Volatile Organic Compounds (ug/l)																		
bis(2-Ethylhexyl) phthalate	6	MCL	<9	-	-	-	-	-	-	-	<9	-	-	-	-	-	-	-
Diethylphthalate	29000	RSL	<9	-	-	-	-	-	-	-	<9	-	-	-	-	-	-	-

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4															
			Eastern Boundary Wells (cont.)										Southern Boundary Wells					
	GW-Benchmarks	Benchmark Source	MW-97-16S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-97-19S	MW-93-5	MW-93-5	MW-93-5	MW-93-5	MW-93-5	MW-93-5
			6/2/2009	11/10/2005	6/1/2006	10/31/2006	5/31/2007	11/1/2007	6/19/2008	11/20/2008	6/2/2009	11/4/2009	11/10/2005	5/31/2006	10/30/2006	5/31/2007	11/1/2007	6/19/2008
			Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Total Inorganic Analytes (ug/l)																		
Aluminum	1430	MEG	63.4J	-	-	-	-	-	-	-	437	<106U	-	-	-	-	-	-
Arsenic	10	MCL	<8	111	51.6J	49.2	27.4	67.3	28.6	42	31	30	84.8	57.5J	73.6	66.2	66	51.8
Barium	2000	MCL	1.5J	-	-	-	-	-	-	-	112	122	-	-	-	-	-	-
Beryllium	4	MCL	<5	-	-	-	-	-	-	-	<5	<5.0	-	-	-	-	-	-
Cadmium	3.5	MEG	<10	-	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-
Calcium	NA	NA	18600	76200	80900J	77800	69900	94300	70400	84500	70800	87900	16900	21100J	16200	12300	12400	14000
Chromium	40	MEG	<15	-	-	-	-	-	-	-	1.4J	1.8	-	-	-	-	-	-
Cobalt	11	RSL	<30	-	-	-	-	-	-	-	2.1J	<1.8U	-	-	-	-	-	-
Copper	1300	MCL	<25	-	-	-	-	-	-	-	1.1J	<0.76U	-	-	-	-	-	-
Iron	26,000	RSL	16.7J	7080	4000	2020	1540	3300J	1840	2670	2390	2050	23900	28600	20800	15000	15900J	15400
Lead	10	MEG	<5	-	-	-	-	-	-	-	1.6J	<2.2U	-	-	-	-	-	-
Magnesium	NA	NA	3970	24800	24200	20200	19600	29400	20100	22400	21300	22200	3190	3850J	2780	2140	2360	2400
Manganese	200	ICL	19.6	2980	2730J	2060	2400	2850	2520	2760	2480	2560	2110	2040	2220	1600	1440	1400
Nickel	140	MEG	<0.46U	-	-	-	-	-	-	-	5.3J	5.0J	-	-	-	-	-	-
Potassium	NA	NA	1700	-	-	-	-	-	-	-	14900	16800	-	-	-	-	-	-
Silver	35	MEG	<15	-	-	-	-	-	-	-	<15	<15	-	-	-	-	-	-
Sodium	20000	MEG	4660	-	-	-	-	-	-	-	55400	62500	-	-	-	-	-	-
Vanadium	180	RSL	<25	-	-	-	-	-	-	-	<25	<25	-	-	-	-	-	-
Zinc	2000	MEG	8.2J	-	-	-	-	-	-	-	3.6J	<16.6U	-	-	-	-	-	-
Dissolved Inorganic Analytes (ug/l)																		
Arsenic	10	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	47.8	-	-
Barium	2000	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	26000	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	10700	-	-
Lead	10	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	200	ICL	-	-	-	-	-	-	-	-	-	-	-	-	-	1190	-	-
Potassium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Quality Analyses (ug/l)																		
Hardness (as CaCO3)	NA	NA	62900	293000	302000J	278000	255000	356000	258000	303000	264000	311000	55300	68600J	51900	39500	40800	44700
Residue, filterable	NA	NA	73000	570000	740000	460000	400000	560000	430000	500000J	430000	490000	120000	350000	95000	71000	64000	94000
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
MEG = Maine Maximum Exposure Guideline, 2008.
RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_
NA = No standard or benchmark is available for this constituent.
ICL = Interim Cleanup Level from the Record of Decision

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4																
			Southern Boundary Wells (cont.)																
	GW-Benchmarks	Benchmark Source	MW-93-5 11/19/2008 Primary	MW-93-5 6/4/2009 Primary	MW-93-5 11/4/2009 Primary	MW-95-7R 11/10/2005 Primary	MW-95-7R 5/31/2006 Primary	MW-95-7R 10/30/2006 Primary	MW-95-7R 5/31/2007 Primary	MW-95-7R 11/1/2007 Primary	MW-95-7R 6/19/2008 Primary	MW-95-7R 11/19/2008 Primary	MW-95-7R 6/4/2009 Primary	MW-95-7R 11/4/2009 Primary	MW-96-9R 11/9/2005 Primary	MW-96-9R 5/31/2006 Primary	MW-96-9R 10/30/2006 Primary	MW-96-9R 5/31/2007 Primary
Volatile Organic Compounds (ug/l)																			
Acetone	6,300	MEG	-	<5	<5	-	-	-	-	-	-	-	<5	<5	-	-	-	-
Benzene	5	MCL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
n-Butylbenzene	NA	NA	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
sec-Butylbenzene	NA	NA	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
Chlorobenzene	91	RSL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
Chloroethane	21000	RSL	-	<2J	<2	-	-	-	-	-	-	-	<2J	<2	-	-	-	-
2-Chlorotoluene	140	MEG	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
1,2-Dichlorobenzene	63	MEG	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
1,3-Dichlorobenzene	60	MEG	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
Dichlorodifluoromethane	1400	MEG	-	<2	<2	-	-	-	-	-	-	-	<2	<2	-	-	-	-
1,1-Dichloroethane	70	MEG	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
1,2-Dichloroethane	4	MEG	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
1,2-Dichloroethene	NA	NA	-	<2	<2	-	-	-	-	-	-	-	<2	<2	-	-	-	-
cis-1,2-Dichloroethene	70	MCL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
1,4-Dichlorobenzene	21	MEG	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
Ethylbenzene	70	MEG	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
Hexachlorobutadiene	4	MEG	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
Isopropylbenzene	680	RSL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
4-Isopropyltoluene	NA	NA	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
Naphthalene	14	MEG	-	<1	<1UJ	-	-	-	-	-	-	-	<1	<1UJ	-	-	-	-
1-Phenylpropane	NA	NA	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
Tetrahydrofuran	70	MEG	-	<10	<10	-	-	-	-	-	-	-	<10	<10	-	-	-	-
Toluene	1000	MCL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
1,2,3-Trichlorobenzene	29	RSL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
1,2,4-Trichlorobenzene	70	MCL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
1,2,4-Trimethylbenzene	15	RSL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
1,3,5-Trimethylbenzene	370	RSL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
m&p-Xylene	1200	RSL	-	<2	<2	-	-	-	-	-	-	-	<2	<2	-	-	-	-
o-Xylene	1200	RSL	-	<1	<1	-	-	-	-	-	-	-	<1	<1	-	-	-	-
Total xylenes	1400	MEG	-	<3	<3	-	-	-	-	-	-	-	<3	<3	-	-	-	-
Semi-Volatile Organic Compounds (ug/l)																			
bis(2-Ethylhexyl) phthalate	6	MCL	-	2J	-	-	-	-	-	-	-	-	<9	-	-	-	-	-
Diethylphthalate	29000	RSL	-	<9	-	-	-	-	-	-	-	-	<9	-	-	-	-	-

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(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4															
			Southern Boundary Wells (cont.)															
	GW-Benchmarks	Benchmark Source	MW-93-5 11/19/2008 Primary	MW-93-5 6/4/2009 Primary	MW-93-5 11/4/2009 Primary	MW-95-7R 11/10/2005 Primary	MW-95-7R 5/31/2006 Primary	MW-95-7R 10/30/2006 Primary	MW-95-7R 5/31/2007 Primary	MW-95-7R 11/1/2007 Primary	MW-95-7R 6/19/2008 Primary	MW-95-7R 11/19/2008 Primary	MW-95-7R 6/4/2009 Primary	MW-95-7R 11/4/2009 Primary	MW-96-9R 11/9/2005 Primary	MW-96-9R 5/31/2006 Primary	MW-96-9R 10/30/2006 Primary	MW-96-9R 5/31/2007 Primary
Total Inorganic Analytes (ug/l)																		
Aluminum	1430	MEG	-	<63.5U	<25.4U	-	-	-	-	-	-	-	<66.8U	<23.6U	-	-	-	-
Arsenic	10	MCL	58.5	52.2	27.1	<8.0	4.9J	<8.0	<8.0U	<8.0U	1.9J	<3.9U	<8	<3.0U	78.3	156J	112	147
Barium	2000	MCL	-	8J	11.4	-	-	-	-	-	-	-	1.8J	2.9J	-	-	-	-
Beryllium	4	MCL	-	<5	<5.0	-	-	-	-	-	-	-	<5	<5.0	-	-	-	-
Cadmium	3.5	MEG	-	<0.23U	<0.17U	-	-	-	-	-	-	-	<10	<10	-	-	-	-
Calcium	NA	NA	14300	11900	13400	13600	12600J	14300	14400	14100	11500	11900	11500	12900	22000	22100J	24200	23000
Chromium	40	MEG	-	<0.76U	<0.75U	-	-	-	-	-	-	-	<0.71U	<0.56U	-	-	-	-
Cobalt	11	RSL	-	8.2	12.0J	-	-	-	-	-	-	-	<30	<30	-	-	-	-
Copper	1300	MCL	-	<3.2UJ	<25	-	-	-	-	-	-	-	<6.8UJ	<25	-	-	-	-
Iron	26,000	RSL	20300	15300	19300	1610	272	582	756	157J	107	286	110	<78.0U	220	267	780	302
Lead	10	MEG	-	7.4	<2.5U	-	-	-	-	-	-	-	<5	<5.0	-	-	-	-
Magnesium	NA	NA	2660	2630	2430	2220	1960J	2070	2250	2370	1580	1960	2280	2060	9110	9160J	9360	9720
Manganese	200	ICL	1770	1280	2160	35.7	17.7	102	45.5	23	10.5	10.6	16.1	11.6	533	424	520	474
Nickel	140	MEG	-	<1.9U	3.5J	-	-	-	-	-	-	-	<0.95U	23.8J	-	-	-	-
Potassium	NA	NA	-	1960J	1900	-	-	-	-	-	-	-	1350J	619J	-	-	-	-
Silver	35	MEG	-	<15	<15	-	-	-	-	-	-	-	<15	<15	-	-	-	-
Sodium	20000	MEG	-	4150J	4250	-	-	-	-	-	-	-	4460J	4220	-	-	-	-
Vanadium	180	RSL	-	<25	<25	-	-	-	-	-	-	-	<25	<25	-	-	-	-
Zinc	2000	MEG	-	<6.2UJ	<4.1U	-	-	-	-	-	-	-	<7.8UJ	<7.4U	-	-	-	-
Dissolved Inorganic Analytes (ug/l)																		
Arsenic	10	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	2000	MCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	26000	RSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	10	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	200	ICL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Quality Analyses (ug/l)																		
Hardness (as CaCO3)	NA	NA	46600	40500	43500	43000	39500J	44400	45100	45000	35100	37800	38100	40700	92400	92800J	98900	97400
Residue, filterable	NA	NA	94000J	94000	43000	62000	310000	78000	52000	49000	52000	47000J	71000	47000	180000	400000	170000	120000
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.
MEG = Maine Maximum Exposure Guideline, 2008.
RSL = EPA Regional Screening Level (RSL) for Tapwater, December 2009. From: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_
NA = No standard or benchmark is available for this constituent.
ICL = Interim Cleanup Level from the Record of Decision

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4					
			Southern Boundary Wells (cont.)					
	GW-Benchmarks	Benchmark Source	MW-96-9R 11/1/2007 Primary	MW-96-9R 6/19/2008 Primary	MW-96-9R 11/19/2008 Primary	MW-96-9R 6/2/2009 Primary	MW-96-9R 11/4/2009 Primary	MW-97-17R 6/4/2009 Primary
Volatile Organic Compounds (ug/l)								
Acetone	6,300	MEG	-	-	-	<5	<5	<5
Benzene	5	MCL	-	-	-	<1	<1	<1
n-Butylbenzene	NA	NA	-	-	-	<1	<1	<1
sec-Butylbenzene	NA	NA	-	-	-	<1	<1	<1
Chlorobenzene	91	RSL	-	-	-	<1	<1	<1
Chloroethane	21000	RSL	-	-	-	<2	<2	<2
2-Chlorotoluene	140	MEG	-	-	-	<1J	<1	<1
1,2-Dichlorobenzene	63	MEG	-	-	-	<1	<1	<1
1,3-Dichlorobenzene	60	MEG	-	-	-	<1	<1	<1
Dichlorodifluoromethane	1400	MEG	-	-	-	<2	<2	<2
1,1-Dichloroethane	70	MEG	-	-	-	<1	<1	<1
1,2-Dichloroethane	4	MEG	-	-	-	<1	<1	<1
1,2-Dichloroethene	NA	NA	-	-	-	<2	<2	<2
cis-1,2-Dichloroethene	70	MCL	-	-	-	<1	<1	<1
1,4-Dichlorobenzene	21	MEG	-	-	-	<1	<1	<1
Ethylbenzene	70	MEG	-	-	-	<1	<1	<1
Hexachlorobutadiene	4	MEG	-	-	-	<1	<1	<1
Isopropylbenzene	680	RSL	-	-	-	<1	<1	<1
4-Isopropyltoluene	NA	NA	-	-	-	<1	<1	<1
Naphthalene	14	MEG	-	-	-	<1	<1UJ	<1
1-Phenylpropane	NA	NA	-	-	-	<1	<1	<1
Tetrahydrofuran	70	MEG	-	-	-	<10	<10	<10
Toluene	1000	MCL	-	-	-	<1	<1	<1
1,2,3-Trichlorobenzene	29	RSL	-	-	-	<1	<1	<1
1,2,4-Trichlorobenzene	70	MCL	-	-	-	<1	<1	<1
1,2,4-Trimethylbenzene	15	RSL	-	-	-	<1	<1	<1
1,3,5-Trimethylbenzene	370	RSL	-	-	-	<1	<1	<1
m&p-Xylene	1200	RSL	-	-	-	<2	<2	<2
o-Xylene	1200	RSL	-	-	-	<1	<1	<1
Total xylenes	1400	MEG	-	-	-	<3	<3	<3
Semi-Volatile Organic Compounds (ug/l)								
bis(2-Ethylhexyl) phthalate	6	MCL	-	-	-	<9	-	<9
Diethylphthalate	29000	RSL	-	-	-	<9	-	<9

Table 5-1: Groundwater Analytical Results Compared to ICLs, MCLs, and MEGs
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

			Landfill Areas 3 & 4					
			Southern Boundary Wells (cont.)					
	GW-Benchmarks	Benchmark Source	MW-96-9R 11/1/2007 Primary	MW-96-9R 6/19/2008 Primary	MW-96-9R 11/19/2008 Primary	MW-96-9R 6/2/2009 Primary	MW-96-9R 11/4/2009 Primary	MW-97-17R 6/4/2009 Primary
Total Inorganic Analytes (ug/l)								
Aluminum	1430	MEG	-	-	-	91.2J	<42.7U	<204U
Arsenic	10	MCL	128	135	149	164	159	5.4J
Barium	2000	MCL	-	-	-	13.6	14.8	14.9
Beryllium	4	MCL	-	-	-	<5	<5.0	<5
Cadmium	3.5	MEG	-	-	-	<10	<10	<10
Calcium	NA	NA	22800	21900	21700	20700	23200	70000
Chromium	40	MEG	-	-	-	0.65J	<0.46U	<0.69U
Cobalt	11	RSL	-	-	-	<30	<30	<30
Copper	1300	MCL	-	-	-	11.9J	<25	<10.2UJ
Iron	26,000	RSL	322J	315	271	304	341	2700
Lead	10	MEG	-	-	-	<5	<5.0	3.5J
Magnesium	NA	NA	10200	8950	9300	9780	9480	11100
Manganese	200	ICL	523	498	468	450	474	107
Nickel	140	MEG	-	-	-	<0.42U	<40	<0.97U
Potassium	NA	NA	-	-	-	2230	1950	<885UJ
Silver	35	MEG	-	-	-	<15	<15	<15
Sodium	20000	MEG	-	-	-	28000	29200	7350J
Vanadium	180	RSL	-	-	-	<25	<25	<25
Zinc	2000	MEG	-	-	-	13.3J	<9.8U	<5.6UJ
Dissolved Inorganic Analytes (ug/l)								
Arsenic	10	MCL	-	-	-	-	-	-
Barium	2000	MCL	-	-	-	-	-	-
Cadmium	3.5	MEG	-	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	-	-
Cobalt	11	RSL	-	-	-	-	-	-
Iron	26000	RSL	-	-	-	-	-	-
Lead	10	MEG	-	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	-	-
Manganese	200	ICL	-	-	-	-	-	-
Potassium	NA	NA	-	-	-	-	-	-
Silver	35	MEG	-	-	-	-	-	-
Sodium	20000	MEG	-	-	-	-	-	-
Water Quality Analyses (ug/l)								
Hardness (as CaCO3)	NA	NA	98600	91500	92500	92000	96900	220000
Residue, filterable	NA	NA	170000	160000	190000J	160000	130000	280000
Dissolved Hardness (as CaCO3)	NA	NA	-	-	-	-	-	-

< = not detected at reporting limit
- = not analyzed
B (organics) = detected in blank
B (inorganics) = estimated
J = estimated
R = rejected
U = revised to non-detect

Benchmark Exceedance

MCL = USEPA Maximum Contaminant Level (MCL). 2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-09-011.

MEG = Maine Maximum Exposure Guideline, 2008.

RSL – EPA Regional Screening Level (RSL) for Tapwater, December 2009. From: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_

NA = No standard or benchmark is available for this constituent.

ICL = Interim Cleanup Level from the Record of Decision

Table 5-2: Summary of Contaminants of Concern Exceeding ICLs in Groundwater (November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

Compounds Exceeding Standards	ICL (ug/L)	MCL/MEG (ug/L)	Area Monitored	Location Exceeding Standard	Number of Exceedances/ Number of Events	Exceedances	
						Low Concentration (ug/L)	High Concentration (ug/L)
Benzene	5	5/6	LF 3&4	MW-95-4R	7/9	6	7
				MW-95-4RD	2/9	8	8
Arsenic	50	10/10	Background	MW-93-1	9/9	26.1	32.8
			LF 1&2	MW-13	9/9	34.9	46.3
				MW-95-5R	1/1	17.8	17.8
				MW-95-8S	3/9	13.1	15
			LF 3&4	MW-93-5	9/9	27.1	84.8
				MW-95-1R	9/9	111	162
				MW-95-1S	9/9	665	1030
				MW-95-3R	9/9	564	645
				MW-95-4R	9/9	376	535
				MW-95-4RD	9/9	113	622
				MW-95-4SA	9/9	111	178
				MW-95-4SB	9/9	65.6	98.8*
				MW-96-9R	9/9	78.3	164
				MW-97-13R	9/9	81.1	244
				MW-97-14S-1	9/9	109	186
				MW-97-19S	9/9	27.4	67.3
Manganese	200	NA/500	LF 1&2	MW-13	9/9	2,610	3,750
				MW-95-8S	3/9	248	267
				MW-95-9S	9/9	296	523
			LF 3&4	MW-93-5	9/9	1,280	2,220
				MW-95-1R	9/9	7,580	18,200
				MW-95-1S	9/9	2,390	4,290
				MW-95-3R	9/9	1,650	2,840
				MW-95-4R	9/9	1,170	1,530
				MW-95-4RD	9/9	1,360	3,030
				MW-95-4SA	9/9	2,060	4,930
				MW-95-4SB	9/9	2,980	5,780
				MW-96-6S	3/9	239	246
				MW-96-9R	9/9	424	533
				MW-97-13R	9/9	2,330	4,920
				MW-97-14S-1	9/9	816	1,400
				MW-97-19S	9/9	2,060	2,980

Notes:

NA = No standard or benchmark is available for this constituent

ICL = Interim Cleanup Level established in ROD (USEPA, 2000)

MEG = Maine Maximum Exposure Guideline (2008)

MCL = USEPA Maximum Contaminant Level (MCL)

2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water.

EPA 822-R-09-011.

*excluding anomalous high of 4,680 ug/l in May 2007

Table 5-3: Summary of Compounds Exceeding Benchmarks in Groundwater (November 2005-2009)

Saco Municipal Landfill
Saco, Maine

Compounds Exceeding Standards	MCL (ug/L)	MEG (ug/L)	Other Benchmark (ug/L)	Area Monitored	Location Exceeding Standard	Number of Exceedances/Number of Events	Exceedances	
							Low Concentration (ug/L)	High Concentration (ug/L)
Cobalt	NA	NA	11*	LF 3&4	MW-93-5	1/2	12	12
					MW-95-1R	2/2	12.9	18.5
					MW-95-1S	2/2	11.5	16.1
					MW-95-3R	2/2	14.9	22.3
Iron	NA	NA	26,000*	LF 1&2	MW-13	9/9	64,000	84,800
				LF 3&4	MW-93-5	1/9	28,600	28,600
					MW-95-1R	2/9	28,200	29,100
					MW-95-1S	9/9	40,700	72,900
					MW-95-3R	9/9	59,200	82,400
					MW-95-4R	2/9	26,600	26,800
					MW-95-4RD	5/9	26,800	30,200
					MW-97-13R	9/9	122,000	195,000
Sodium	NA	20,000	--	Background	MW-93-1	2/2	28,800	29,400
					MW-93-7	2/2	78,100	103,000
				LF 1&2	MW-13	2/2	64,800	72,100
					MW-95-5R	1/1	144,000	144,000
				LF 3&4	MW-95-3R	2/2	31,800	39,200
					MW-95-4R	2/2	76,300	90,300
					MW-95-4RD	2/2	89,600	97,200
					MW-95-4SA	1/2	20,500	20,500
					MW-95-4SB	2/2	30,200	42,600
					MW-96-9R	2/2	28,800	29,200
					MW-97-14S-1	2/2	37,100	44,200
					MW-97-19S	2/2	55,400	62,500

Notes:

MEG = Maine Maximum Exposure Guideline (2008)

MCL = USEPA Maximum Contaminant Level (MCL)

2009 Edition of the Drinking Water Standards and Health Advisories. Office of Water.

EPA 822-R-09-011.

*EPA Regional Screening Level (RSL) for Tapwater, December 2009. From:

http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_sl_table_run_DECEMBER2009.pdf

NA = No standard or benchmark is available for this constituent.

-- = Because a federal or state standard is available for this constituent, a secondary benchmark is not provided.

Table 5-4: Surface Water Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SW-7 11/10/2005 Primary	SW-7 6/2/2006 Primary	SW-7 10/31/2006 Primary	SW-7 6/1/2007 Primary	SW-7 6/20/2008 Primary	SW-7 6/5/2009 Primary	SW-7 11/6/2009 Primary	SW-13 11/10/2005 Primary	SW-13 6/2/2006 Primary	SW-13 10/31/2006 Primary
Total Inorganic Analytes (ug/l)												
Aluminum	87	NRWQC	-	-	-	-	-	246J	<95.5U	-	-	-
Arsenic	150	NRWQC	<8.0	<8.0	<8.0	<8.0	<8.0	<8UJ	<8.0	5.6	<14.5U	6.6
Barium	4	FWSB	-	-	-	-	-	10.4	10.4	-	-	-
Calcium	116000	FWSB	3410	4480	-	3920	4090	4160	4440	10800	16800	-
Cobalt	23	FWSB	-	-	-	-	-	<30UJ	<30	-	-	-
Copper	2.99	SWQC	-	-	-	-	-	<25	<25	-	-	-
Iron	1000	NRWQC	695J	833J	627	378J	448	424	254	553J	1750J	1410
Lead	0.41	SWQC	-	-	-	-	-	<5	<5.0	-	-	-
Magnesium	82000	FWSB	1690	1800	-	1760	1600	1700	1790	1830	3110	-
Manganese	120	FWSB	177J	362	262	227	174	171	62.8	73.1J	460	224
Nickel	31	NRWQC*	-	-	-	-	-	<40	<40	-	-	-
Potassium	53000	FWSB	-	-	-	-	-	<3380UJ	3800	-	-	-
Sodium	680000	FWSB	-	-	-	-	-	6850	7330	-	-	-
Vanadium	20	FWSB	-	-	-	-	-	<25	<25	-	-	-
Zinc	27.1	SWQC	-	-	-	-	-	1.2J	<2.0U	-	-	-
Water Quality Parameters												
Hardness carbonate (as CaCO3)	-		15500	18600	-	17000	16800	17400	18500	34400	54700	-

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect

Benchmark exceedance

NRWQC = National Recommended Water Quality Criteria,
Criterion Continuous Concentration. USEPA 2009.
Office of Water, Office of Science and Technology.
*Hardness-dependent NRWQC were adjusted
in accordance with the following equation (EPA 2009):
CCC (dissolved) = exp{mc[ln(hardness] + bc} * (CF)
Site-specific average and median hardness of 55 mg/L
CaCO3, 2001-2009 data. ln(hardness) = 4.007333185
FWSB = EPA Region III Freshwater Screening Benchmarks (FWSB),
from http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fw/screenbench.htm
SWQC = Maine Statewide Water Quality Criteria, 2000
NA = No standard or benchmark is available for this constituent.
-- = Because a federal standard is available for this constituent,
a secondary benchmark is not provided.

Table 5-4: Surface Water Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SW-13	SW-13	SW-13	SW-13	SW-21	SW-21	SW-21	SW-21	SW-21	SW-21
			6/1/2007	6/20/2008	6/5/2009	11/6/2009	11/10/2005	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009
			Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Total Inorganic Analytes (ug/l)												
Aluminum	87	NRWQC	-	-	232J	<120U	-	-	-	-	-	272
Arsenic	150	NRWQC	17	30.2	19.4	15.8	<8.0	<8.0U	<8.0	2.1	2.8J	<8UJ
Barium	4	FWSB	-	-	28.5	20.9	-	-	-	-	-	11.5
Calcium	116000	FWSB	16100	25000	18900	16700	10300	12500	-	9720	12100	10100
Cobalt	23	FWSB	-	-	0.23J	<30	-	-	-	-	-	<30UJ
Copper	2.99	SWQC	-	-	<25	<0.50U	-	-	-	-	-	1.1J
Iron	1000	NRWQC	1890J	2670	1840	1470	462J	901J	1040	858J	995	662
Lead	0.41	SWQC	-	-	1.6J	<5.0	-	-	-	-	-	<5
Magnesium	82000	FWSB	3620	5400	3970	3260	1680	2110	-	2090	2450	1920
Manganese	120	FWSB	546	966	667	415	28.6J	98.3	65.9	116	91.2	96.9
Nickel	31	NRWQC*	-	-	1.3J	<0.94U	-	-	-	-	-	<40
Potassium	53000	FWSB	-	-	<3230UJ	3180	-	-	-	-	-	2030J
Sodium	680000	FWSB	-	-	28000	22000	-	-	-	-	-	21900
Vanadium	20	FWSB	-	-	<25	<25	-	-	-	-	-	<25
Zinc	27.1	SWQC	-	-	1.5J	<2.0U	-	-	-	-	-	2.4J
Water Quality Parameters												
Hardness carbonate (as CaCO3)	-		55100	84600	63600	55200	32700	40000	-	32900	40400	33000

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect

Benchmark exceedance

NRWQC = National Recommended Water Quality Criteria,
Criterion Continuous Concentration. USEPA 2009.
Office of Water, Office of Science and Technology.
*Hardness-dependent NRWQC were adjusted
in accordance with the following equation (EPA 2009):
CCC (dissolved) = exp{mc[ln(hardness] + bc} * (CF)
Site-specific average and median hardness of 55 mg/L
CaCO3, 2001-2009 data. ln(hardness) = 4.007333185
FWSB = EPA Region III Freshwater Screening Benchmarks (FWSB),
from http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fw/screenbench.htm
SWQC = Maine Statewide Water Quality Criteria, 2000
NA = No standard or benchmark is available for this constituent.
-- = Because a federal standard is available for this constituent,
a secondary benchmark is not provided.

Table 5-4: Surface Water Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SW-21	SW-31	SW-31	SW-31	SW-31	SW-31	SW-31	SW-31	SW-31	SW-34
			11/6/2009	11/10/2005	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/20/2008	6/5/2009	11/6/2009	11/10/2005
			Primary	Primary	Primary	Primary	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Total Inorganic Analytes (ug/l)												
Aluminum	87	NRWQC	<140U	-	-	-	-	-	-	<191U	<91.4U	-
Arsenic	150	NRWQC	<8.0	3.8	<18.3U	4.9	12.8	13	13.2	12.2J	10.8	5.2
Barium	4	FWSB	9.4	-	-	-	-	-	-	21.5	17.3	-
Calcium	116000	FWSB	10200	11700	19900	-	18500	27400	27400	21300	19000	11000
Cobalt	23	FWSB	<30	-	-	-	-	-	-	<30	<30	-
Copper	2.99	SWQC	<25	-	-	-	-	-	-	0.93J	<0.49U	-
Iron	1000	NRWQC	605	614J	1380J	856	1130J	1160	1160	1070	854	543J
Lead	0.41	SWQC	<5.0	-	-	-	-	-	-	1.5J	<5.0	-
Magnesium	82000	FWSB	1940	2060	3930	-	4270	6130	6170	4560	4040	1890
Manganese	120	FWSB	31.1	78.1J	392	170	452	747	750	548	332	74.8J
Nickel	31	NRWQC*	<40	-	-	-	-	-	-	0.89J	<0.80U	-
Potassium	53000	FWSB	2590	-	-	-	-	-	-	<3370UJ	3100	-
Sodium	680000	FWSB	17100	-	-	-	-	-	-	27400	22900	-
Vanadium	20	FWSB	<0.61U	-	-	-	-	-	-	<25	<25	-
Zinc	27.1	SWQC	<2.4U	-	-	-	-	-	-	0.45J	<1.3U	-
Water Quality Parameters												
Hardness carbonate (as CaCO3)	-		33600	37700	65900	-	63700	93500	93700	72000	64200	35200

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect

Benchmark exceedance

NRWQC = National Recommended Water Quality Criteria,
Criterion Continuous Concentration. USEPA 2009.
Office of Water, Office of Science and Technology.
*Hardness-dependent NRWQC were adjusted
in accordance with the following equation (EPA 2009):
CCC (dissolved) = exp{mc[ln(hardness] + bc} * (CF)
Site-specific average and median hardness of 55 mg/L
CaCO3, 2001-2009 data. ln(hardness) = 4.007333185
FWSB = EPA Region III Freshwater Screening Benchmarks (FWSB),
from http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fw/screenbench.htm
SWQC = Maine Statewide Water Quality Criteria, 2000
NA = No standard or benchmark is available for this constituent.
-- = Because a federal standard is available for this constituent,
a secondary benchmark is not provided.

Table 5-4: Surface Water Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SW-34	SW-34	SW-34	SW-34	SW-34	SW-34	SW-34	SW-34	SW-37	SW-37
			11/10/2005	6/2/2006	10/31/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009	11/6/2009	11/10/2005	6/2/2006
			Duplicate 1	Primary	Primary	Duplicate 1	Primary	Primary	Primary	Primary	Primary	Primary
Total Inorganic Analytes (ug/l)												
Aluminum	87	NRWQC	-	-	-	-	-	-	<198U	<122U	-	-
Arsenic	150	NRWQC	<8.0	<15.7U	<8.0	3.7	15.4	22.8	17.1	13.7	6.4	<12.4U
Barium	4	FWSB	-	-	-	-	-	-	26.3	20.3	-	-
Calcium	116000	FWSB	11100	17800	-	-	16700	25300	19700	17200	11100	17500
Cobalt	23	FWSB	-	-	-	-	-	-	<30UJ	<30	-	-
Copper	2.99	SWQC	-	-	-	-	-	-	0.92J	<0.62U	-	-
Iron	1000	NRWQC	564	1660J	968	959	1600J	1880	1430	1230	576J	1680J
Lead	0.41	SWQC	-	-	-	-	-	-	1.6J	<5.0	-	-
Magnesium	82000	FWSB	2080	3340	-	-	3770	5500	4060	3490	1890	3230
Manganese	120	FWSB	80.9	464	195	191	516	871	646	412	85.4J	473
Nickel	31	NRWQC*	-	-	-	-	-	-	1.1J	<1.0U	-	-
Potassium	53000	FWSB	-	-	-	-	-	-	<3280UJ	3170	-	-
Sodium	680000	FWSB	-	-	-	-	-	-	27500	22600	-	-
Vanadium	20	FWSB	-	-	-	-	-	-	<25	<25	-	-
Zinc	27.1	SWQC	-	-	-	-	-	-	2.9J	<1.4U	-	-
Water Quality Parameters												
Hardness carbonate (as CaCO3)	-		36200	58100	-	-	57300	85800	65900	57300	35600	57000

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect

Benchmark exceedance

NRWQC = National Recommended Water Quality Criteria,
Criterion Continuous Concentration. USEPA 2009.
Office of Water, Office of Science and Technology.
*Hardness-dependent NRWQC were adjusted
in accordance with the following equation (EPA 2009):
CCC (dissolved) = exp{mc[ln(hardness] + bc} * (CF)
Site-specific average and median hardness of 55 mg/L
CaCO3, 2001-2009 data. ln(hardness) = 4.007333185
FWSB = EPA Region III Freshwater Screening Benchmarks (FWSB),
from http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fw/screenbench.htm
SWQC = Maine Statewide Water Quality Criteria, 2000
NA = No standard or benchmark is available for this constituent.
-- = Because a federal standard is available for this constituent,
a secondary benchmark is not provided.

Table 5-4: Surface Water Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SW-37 6/2/2006 Duplicate 1	SW-37 10/31/2006 Primary	SW-37 6/1/2007 Primary	SW-37 6/20/2008 Primary	SW-37 6/5/2009 Primary	SW-37 6/5/2009 Duplicate 1	SW-37 11/6/2009 Primary	SW-37 11/6/2009 Duplicate 1	SW-52 11/10/2005 Primary	SW-52 6/2/2006 Primary
Total Inorganic Analytes (ug/l)												
Aluminum	87	NRWQC	-	-	-	-	221J	225J	<115U	<110U	-	-
Arsenic	150	NRWQC	<13.8U	7.6	17.7	26.9	18.1	18.8	14.5	15.4	3.5	<13.9U
Barium	4	FWSB	-	-	-	-	27.4	27.6	22.2	21.4	-	-
Calcium	116000	FWSB	16200	-	16400	25000	18900	19000	16500	17000	10600	15600
Cobalt	23	FWSB	-	-	-	-	<30UJ	<30UJ	<30	<30	-	-
Copper	2.99	SWQC	-	-	-	-	6.5J	0.85J	<0.82U	<0.87U	-	-
Iron	1000	NRWQC	1540J	1300	1820J	2400	1610	1620	1380	1400	498J	1590J
Lead	0.41	SWQC	-	-	-	-	1.6J	<5	<5.0	<5.0	-	-
Magnesium	82000	FWSB	2980	-	3660	5370	3870	3850	3570	3450	1770	2780
Manganese	120	FWSB	437	217	545	961	652	648	440	436	63.3J	356
Nickel	31	NRWQC*	-	-	-	-	1.2J	1.2J	<0.97U	0.91	-	-
Potassium	53000	FWSB	-	-	-	-	<3120UJ	<3270UJ	3250	3250	-	-
Sodium	680000	FWSB	-	-	-	-	26900	26800	23600	22600	-	-
Vanadium	20	FWSB	-	-	-	-	<25	<25	<25	<25	-	-
Zinc	27.1	SWQC	-	-	-	-	1.6J	0.43J	<1.6U	<1.8U	-	-
Water Quality Parameters												
Hardness carbonate (as CaCO3)	-		52700	-	56000	84400	63100	63400	55900	56800	33900	50500

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect

Benchmark exceedance

NRWQC = National Recommended Water Quality Criteria,
Criterion Continuous Concentration. USEPA 2009.
Office of Water, Office of Science and Technology.
*Hardness-dependent NRWQC were adjusted
in accordance with the following equation (EPA 2009):
CCC (dissolved) = exp{mc[ln(hardness] + bc} * (CF)
Site-specific average and median hardness of 55 mg/L
CaCO3, 2001-2009 data. ln(hardness) = 4.007333185
FWSB = EPA Region III Freshwater Screening Benchmarks (FWSB),
from http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fw/screenbench.htm
SWQC = Maine Statewide Water Quality Criteria, 2000
NA = No standard or benchmark is available for this constituent.
-- = Because a federal standard is available for this constituent,
a secondary benchmark is not provided.

Table 5-4: Surface Water Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SW-52 10/31/2006 Primary	SW-52 6/1/2007 Primary	SW-52 6/1/2007 Duplicate 1	SW-52 6/20/2008 Primary	SW-52 6/5/2009 Primary	SW-52 11/6/2009 Primary	SW-69 11/10/2005 Primary	SW-69 6/2/2006 Primary	SW-69 10/31/2006 Primary	SW-69 6/1/2007 Primary
Total Inorganic Analytes (ug/l)												
Aluminum	87	NRWQC	-	-	-	-	254J	<142U	-	-	-	-
Arsenic	150	NRWQC	4.8	15.4	14.9	29.6	25.4	14	<8.0	<9.3U	<8.0	9.4
Barium	4	FWSB	-	-	-	-	27.9	19.7	-	-	-	-
Calcium	116000	FWSB	-	14800	15200	23400	17400	15800	10000	21700	-	20100
Cobalt	23	FWSB	-	-	-	-	0.21J	<30	-	-	-	-
Copper	2.99	SWQC	-	-	-	-	<25	<25	-	-	-	-
Iron	1000	NRWQC	1400	1900J	1890J	2700	2810	1550	485J	1060J	634	918J
Lead	0.41	SWQC	-	-	-	-	<5	<5.0	-	-	-	-
Magnesium	82000	FWSB	-	3230	3290	4830	3470	3020	1660	4210	-	4570
Manganese	120	FWSB	168	430	444	820	562	337	47.8J	293	116	370
Nickel	31	NRWQC*	-	-	-	-	0.9J	<0.93U	-	-	-	-
Potassium	53000	FWSB	-	-	-	-	<3000UJ	3080	-	-	-	-
Sodium	680000	FWSB	-	-	-	-	27100	22100	-	-	-	-
Vanadium	20	FWSB	-	-	-	-	0.71J	<25	-	-	-	-
Zinc	27.1	SWQC	-	-	-	-	3.6J	<2.4U	-	-	-	-
Water Quality Parameters												
Hardness carbonate (as CaCO3)	-		-	50300	51400	78300	57800	51800	31900	71400	-	69100

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect

Benchmark exceedance

NRWQC = National Recommended Water Quality Criteria,
Criterion Continuous Concentration. USEPA 2009.
Office of Water, Office of Science and Technology.
*Hardness-dependent NRWQC were adjusted
in accordance with the following equation (EPA 2009):
CCC (dissolved) = exp{mc[ln(hardness] + bc} * (CF)
Site-specific average and median hardness of 55 mg/L
$CaCO_3$, 2001-2009 data. ln(hardness) = 4.007333185
FWSB = EPA Region III Freshwater Screening Benchmarks (FWSB),
from http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fw/screenbench.htm
SWQC = Maine Statewide Water Quality Criteria, 2000
NA = No standard or benchmark is available for this constituent.
-- = Because a federal standard is available for this constituent,
a secondary benchmark is not provided.

Table 5-5: Summary of Compounds Exceeding Benchmarks in Surface Water (November 2005-2009)

Saco Municipal Landfill
Saco, Maine

Compounds Exceeding Standards	NRWQC - CCC (ug/L)	SWQC - CCC (ug/L)	Other Benchmark (ug/L)	Location Exceeding Standard	Number of Exceedances/Number of Events	Exceedances	
						Low Concentration (ug/L)	High Concentration (ug/L)
Aluminum	87	87	--	SW-7	1/2	246	246
				SW-13	1/2	232	232
				SW-21	1/2	272	272
				SW-37	1/2	221	221
				SW-52	1/2	254	254
Arsenic	150	190	3**	SW-13	6/7	5.6	30.2
				SW-31	6/7	3.8	21.5
				SW-34	5/7	5.2	22.8
				SW-37	6/7	6.4	26.9
				SW-52	6/7	3.5	29.6
				SW-69	4/7	7.2	10.2
				SW-103	6/7	3.6	10.3
Barium	NA	NA	4***	SW-7	2/2	10.4	10.4
				SW-13	2/2	20.9	28.5
				SW-21	2/2	9.4	11.5
				SW-31	2/2	17.3	21.5
				SW-34	2/2	20.3	26.3
				SW-37	2/2	22.2	27.4
				SW-52	2/2	19.7	27.9
				SW-69	2/2	13.7	16.2
				SW-103	2/2	13.5	15.8
Copper	5.4*	2.99	--	SW-37	1/2	6.5	6.5
Iron	1,000	1,000	--	SW-13	6/7	1,410	2,670
				SW-21	1/7	1,040	1,040
				SW-31	4/7	1,070	1,380
				SW-34	5/7	1,230	1,880
				SW-37	6/7	1,300	2,400
				SW-52	6/7	1,400	2,700
				SW-69	1/7	1,060	1,060
				SW-103	1/7	1,040	1,040
Lead	1.3*	0.41	--	SW-13	1/2	1.6	1.6
				SW-31	1/2	1.5	1.5
				SW-34	1/2	1.6	1.6
				SW-37	1/2	1.6	1.6
				SW-103	1/2	1.5	1.5
Manganese	NA	NA	120***	SW-7	6/7	171	362
				SW-13	6/7	224	966
				SW-31	6/7	170	747
				SW-34	6/7	195	871
				SW-37	6/7	217	961
				SW-52	6/7	168	820
				SW-69	5/7	237	555
				SW-103	5/7	207	503

Notes:

National Recommended Water Quality Criteria, Criterion Continuous Concentration (NRWQC CCC). USEPA 2009. Office of Water, Office of Science and Technology.

Maine Statewide Water Quality Criteria, 2000

*Hardness-dependent NRWQC were adjusted in accordance with the following equation (EPA 2009):

CCC (dissolved) = exp{mc[ln(hardness] + bc} * (CF)

Site-specific average and median hardness of 55 mg/L CaCO3, 2001-2009 data.

** Site-specific performance standard of 3 ug/L from the ROD was used for the comparison

***EPA Region III Freshwater Screening Benchmarks (FWSB), from http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fw/screenbench.htm

NA = No standard or benchmark is available for this constituent.

-- = Because a federal or state standard is available for this constituent, a secondary benchmark is not provided.

Table 5-6: Sediment Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SD-7 11/10/2005 Primary	SD-7 6/2/2006 Primary	SD-7 6/1/2007 Primary	SD-7 6/20/2008 Primary	SD-7 6/5/2009 Primary	SD-13 11/10/2005 Primary	SD-13 6/2/2006 Primary	SD-13 6/1/2007 Primary	SD-13 6/20/2008 Primary	SD-13 6/5/2009 Primary
Total Inorganic Analytes (mg/kg)												
Arsenic	9.79	TEC	2.4	<3.7U	5.8	3.7	2.1	42.6	18.8	30.8	39.8	41
Iron	20000	FSSB	5460	14400	15000	8910	6440	13000	11600	10200	10900	12600
Manganese	460	FSSB	575J	1340	857	528	399	139J	120	232	190	187
Aluminum	NA	NA	-	-	-	-	6070	-	-	-	-	5840
Barium	NA	NA	-	-	-	-	29.5	-	-	-	-	34.6
Beryllium	NA	NA	-	-	-	-	0.7	-	-	-	-	0.38J
Cadmium	0.99	TEC	-	-	-	-	0.13J	-	-	-	-	0.17J
Calcium	NA	NA	-	-	-	-	727J	-	-	-	-	1060J
Chromium	43.4	TEC	-	-	-	-	6.8	-	-	-	-	15.1
Cobalt	50	FSSB	-	-	-	-	2.3J	-	-	-	-	3.1
Copper	31.6	TEC	-	-	-	-	4.7	-	-	-	-	6.5
Lead	35.8	TEC	-	-	-	-	7.2	-	-	-	-	6.2
Magnesium	NA	NA	-	-	-	-	1210J	-	-	-	-	2600J
Mercury	0.18	TEC	-	-	-	-	<0.042UJ	-	-	-	-	<0.043UJ
Nickel	22.7	TEC	-	-	-	-	4.2	-	-	-	-	13.3
Potassium	NA	NA	-	-	-	-	1160J	-	-	-	-	1010J
Silver	1	FSSB	-	-	-	-	<1.2UJ	-	-	-	-	<1.5UJ
Sodium	NA	NA	-	-	-	-	72.5J	-	-	-	-	<89.6U
Thallium	NA	NA	-	-	-	-	<1.2	-	-	-	-	<1.5
Vanadium	NA	NA	-	-	-	-	9.8	-	-	-	-	12.2
Zinc	121	TEC	-	-	-	-	23.8	-	-	-	-	30.2
Solids (%)												
Solids - Total Residue	NA		68	70	64	73	65	73	82	77	76	76

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect during validation

Benchmark exceedance

*TEC: Threshold Effects Concentration. MacDonald, D.D., Ingersoll, C.G. and Berger, T.A. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

**EPA Region III. Freshwater Sediment Screening Benchmarks (FSSB), from : http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fwsed/screenbench.htm

TECs were used as the preferential source of sediment benchmarks.

NA = Not standard or benchmark is available for this constituent

Table 5-6: Sediment Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SD-21 11/10/2005 Primary	SD-21 6/2/2006 Primary	SD-21 6/1/2007 Primary	SD-21 6/20/2008 Primary	SD-21 6/5/2009 Primary	SD-31 11/10/2005 Primary	SD-31 6/2/2006 Primary	SD-31 6/1/2007 Primary	SD-31 6/20/2008 Primary	SD-31 6/20/2008 Duplicate 1	SD-31 6/5/2009 Primary
Total Inorganic Analytes (mg/kg)													
Arsenic	9.79	TEC	8.5	24.6	4.7	4	5.3	30.2	59.5	58.8	60.3	54.6	32.5
Iron	20000	FSSB	10700	9700	7400	6900	13400	7080	10800	10600	10300	9900	7350
Manganese	460	FSSB	349J	231	304	203	238	464J	1030	954	1270	1450	1020
Aluminum	NA	NA	-	-	-	-	7470	-	-	-	-	-	3950
Barium	NA	NA	-	-	-	-	41.9	-	-	-	-	-	42.6
Beryllium	NA	NA	-	-	-	-	0.51	-	-	-	-	-	0.29J
Cadmium	0.99	TEC	-	-	-	-	0.13J	-	-	-	-	-	0.12J
Calcium	NA	NA	-	-	-	-	1910J	-	-	-	-	-	1040J
Chromium	43.4	TEC	-	-	-	-	22.4	-	-	-	-	-	7
Cobalt	50	FSSB	-	-	-	-	4.1	-	-	-	-	-	2.8J
Copper	31.6	TEC	-	-	-	-	8	-	-	-	-	-	3
Lead	35.8	TEC	-	-	-	-	5.8	-	-	-	-	-	4
Magnesium	NA	NA	-	-	-	-	4800J	-	-	-	-	-	1440J
Mercury	0.18	TEC	-	-	-	-	<0.029UJ	-	-	-	-	-	<0.032UJ
Nickel	22.7	TEC	-	-	-	-	15.6	-	-	-	-	-	6.2
Potassium	NA	NA	-	-	-	-	1830J	-	-	-	-	-	565J
Silver	1	FSSB	-	-	-	-	<1.4UJ	-	-	-	-	-	0.12J
Sodium	NA	NA	-	-	-	-	134	-	-	-	-	-	<86.9U
Thallium	NA	NA	-	-	-	-	0.28J	-	-	-	-	-	<1.8
Vanadium	NA	NA	-	-	-	-	20.9	-	-	-	-	-	7.1
Zinc	121	TEC	-	-	-	-	33.3	-	-	-	-	-	25.8
Solids (%)													
Solids - Total Residue	NA		86	80	72	78	83	70	66	65	68	66	74

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect during validation

Benchmark exceedance

*TEC: Threshold Effects Concentration. MacDonald, D.D., Ingersoll, C.G. and Berger, T.A. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

**EPA Region III. Freshwater Sediment Screening Benchmarks (FSSB), from : http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fwsed/screenbench.htm

TECs were used as the preferential source of sediment benchmarks.

NA = Not standard or benchmark is available for this constituent

Table 5-6: Sediment Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SD-34 11/10/2005 Primary	SD-34 11/10/2005 Duplicate 1	SD-34 6/2/2006 Primary	SD-34 6/1/2007 Primary	SD-34 6/20/2008 Primary	SD-34 6/5/2009 Primary	SD-37 11/10/2005 Primary	SD-37 6/2/2006 Primary	SD-37 6/2/2006 Duplicate 1	SD-37 6/1/2007 Primary	SD-37 6/20/2008 Primary
Total Inorganic Analytes (mg/kg)													
Arsenic	9.79	TEC	22.2	13.8	32.1	36.6	207	56.3	58.8	31.6	34.4	22.4	50.8
Iron	20000	FSSB	8550	7410	15600	7470	29700	13600	16400	22300	26300	8490	9720
Manganese	460	FSSB	182J	163J	329	307	2420	438	245J	282	315	307	136
Aluminum	NA	NA	-	-	-	-	-	5640	-	-	-	-	-
Barium	NA	NA	-	-	-	-	-	44.1	-	-	-	-	-
Beryllium	NA	NA	-	-	-	-	-	0.43	-	-	-	-	-
Cadmium	0.99	TEC	-	-	-	-	-	0.19	-	-	-	-	-
Calcium	NA	NA	-	-	-	-	-	1090J	-	-	-	-	-
Chromium	43.4	TEC	-	-	-	-	-	12.4	-	-	-	-	-
Cobalt	50	FSSB	-	-	-	-	-	3.2	-	-	-	-	-
Copper	31.6	TEC	-	-	-	-	-	4.9	-	-	-	-	-
Lead	35.8	TEC	-	-	-	-	-	5.8	-	-	-	-	-
Magnesium	NA	NA	-	-	-	-	-	2390J	-	-	-	-	-
Mercury	0.18	TEC	-	-	-	-	-	<0.037UJ	-	-	-	-	-
Nickel	22.7	TEC	-	-	-	-	-	10	-	-	-	-	-
Potassium	NA	NA	-	-	-	-	-	1000J	-	-	-	-	-
Silver	1	FSSB	-	-	-	-	-	<1.3UJ	-	-	-	-	-
Sodium	NA	NA	-	-	-	-	-	<157U	-	-	-	-	-
Thallium	NA	NA	-	-	-	-	-	<1.3	-	-	-	-	-
Vanadium	NA	NA	-	-	-	-	-	11.8	-	-	-	-	-
Zinc	121	TEC	-	-	-	-	-	36.8	-	-	-	-	-
Solids (%)													
Solids - Total Residue	NA		62	64	59	62	38	75	56	52	49	76	74

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect during validation

Benchmark exceedance

*TEC: Threshold Effects Concentration. MacDonald, D.D., Ingersoll, C.G. and Berger, T.A. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

**EPA Region III. Freshwater Sediment Screening Benchmarks (FSSB), from : http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fwsed/screenbench.htm

TECs were used as the preferential source of sediment benchmarks.

NA = Not standard or benchmark is available for this constituent

Table 5-6: Sediment Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SD-37 6/5/2009 Primary	SD-37 6/5/2009 Duplicate 1	SD-52 11/10/2005 Primary	SD-52 6/2/2006 Primary	SD-52 6/1/2007 Primary	SD-52 6/1/2007 Duplicate 1	SD-52 6/20/2008 Primary	SD-52 6/5/2009 Primary	SD-69 11/10/2005 Primary	SD-69 6/2/2006 Primary	SD-69 6/1/2007 Primary
Total Inorganic Analytes (mg/kg)													
Arsenic	9.79	TEC	39.3	33.8	25	<3.9U	13.2	15.9	12.4	34.3	10.2	8.5	13.1
Iron	20000	FSSB	9990	7670	6310	4640	7690	9880	5890	11200	4170	3970	5060
Manganese	460	FSSB	545	388	131J	104	216	306	71.4	313	137J	102	222
Aluminum	NA	NA	4550	4270	-	-	-	-	-	7020	-	-	-
Barium	NA	NA	40.9	30.8	-	-	-	-	-	38.9	-	-	-
Beryllium	NA	NA	0.4J	0.45J	-	-	-	-	-	0.59	-	-	-
Cadmium	0.99	TEC	0.15J	0.13J	-	-	-	-	-	0.17	-	-	-
Calcium	NA	NA	1110J	811J	-	-	-	-	-	1420J	-	-	-
Chromium	43.4	TEC	9.9	7.7	-	-	-	-	-	10.6	-	-	-
Cobalt	50	FSSB	2.3	2.1	-	-	-	-	-	2.6J	-	-	-
Copper	31.6	TEC	4.6	3.4	-	-	-	-	-	5.3	-	-	-
Lead	35.8	TEC	6.1	5	-	-	-	-	-	9.3	-	-	-
Magnesium	NA	NA	1500J	1340J	-	-	-	-	-	1770J	-	-	-
Mercury	0.18	TEC	<0.043UJ	<0.041UJ	-	-	-	-	-	0.02J	-	-	-
Nickel	22.7	TEC	7.2	5.8	-	-	-	-	-	6.6	-	-	-
Potassium	NA	NA	804J	938	-	-	-	-	-	1050J	-	-	-
Silver	1	FSSB	<1.5UJ	0.15J	-	-	-	-	-	<1.3UJ	-	-	-
Sodium	NA	NA	<100U	<70.3U	-	-	-	-	-	<153U	-	-	-
Thallium	NA	NA	<1.5	<1.9	-	-	-	-	-	<1.3	-	-	-
Vanadium	NA	NA	10.3	7.6	-	-	-	-	-	12	-	-	-
Zinc	121	TEC	30.3	31.2	-	-	-	-	-	39.4	-	-	-
Solids (%)													
Solids - Total Residue	NA		71	69	73	58	61	42	78	62	77	75	76

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect during validation

Benchmark exceedance

*TEC: Threshold Effects Concentration. MacDonald, D.D., Ingersoll, C.G. and Berger, T.A. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

**EPA Region III. Freshwater Sediment Screening Benchmarks (FSSB), from : http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fwsed/screenbench.htm

TECs were used as the preferential source of sediment benchmarks.

NA = Not standard or benchmark is available for this constituent

Table 5-6: Sediment Analytical Results Compared to Benchmarks
(November 2005 - 2009)

Saco Municipal Landfill
Saco, Maine

	Benchmark	Benchmark Source	SD-69 6/20/2008 Primary	SD-69 6/5/2009 Primary	SD-103 11/10/2005 Primary	SD-103 6/2/2006 Primary	SD-103 6/1/2007 Primary	SD-103 6/20/2008 Primary	SD-103 6/5/2009 Primary
Total Inorganic Analytes (mg/kg)									
Arsenic	9.79	TEC	10.9	7.3	17.9	21.2	12.1	17.6	13.2
Iron	20000	FSSB	4310	3570	6090	19300	5040	11900	5240
Manganese	460	FSSB	77.1	185	274J	558	348	311	462
Aluminum	NA	NA	-	2590	-	-	-	-	3750
Barium	NA	NA	-	12.4	-	-	-	-	21.7
Beryllium	NA	NA	-	0.21J	-	-	-	-	0.28J
Cadmium	0.99	TEC	-	<0.05U	-	-	-	-	<0.08U
Calcium	NA	NA	-	606J	-	-	-	-	638J
Chromium	43.4	TEC	-	5.1	-	-	-	-	6.5
Cobalt	50	FSSB	-	1.3	-	-	-	-	2.1J
Copper	31.6	TEC	-	<2.5U	-	-	-	-	3.1
Lead	35.8	TEC	-	2	-	-	-	-	3.5
Magnesium	NA	NA	-	1020J	-	-	-	-	1280J
Mercury	0.18	TEC	-	<0.038UJ	-	-	-	-	<0.04UJ
Nickel	22.7	TEC	-	4.8	-	-	-	-	5.6
Potassium	NA	NA	-	423J	-	-	-	-	526J
Silver	1	FSSB	-	<1.7UJ	-	-	-	-	0.09J
Sodium	NA	NA	-	<44.6U	-	-	-	-	<68U
Thallium	NA	NA	-	<1.7	-	-	-	-	<1.6
Vanadium	NA	NA	-	5	-	-	-	-	7.4
Zinc	121	TEC	-	13.5	-	-	-	-	18.3
Solids (%)									
Solids - Total Residue	NA		78	77	79	86	74	85	75

< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect during validation

Benchmark exceedance

*TEC: Threshold Effects Concentration. MacDonald, D.D., Ingersoll, C.G. and Berger, T.A. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

**EPA Region III. Freshwater Sediment Screening Benchmarks (FSSB), from : http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fwsed/screenbench.htm

TECs were used as the preferential source of sediment benchmarks.

NA = Not standard or benchmark is available for this constituent

Table 5-7: Summary of Compounds Exceeding Benchmarks in Sediment (November 2005-2009)

Saco Municipal Landfill
Saco, Maine

Compounds Exceeding Standards	Benchmark (mg/kg)	Location Exceeding Standard	Number of Exceedances/Number of Events	Exceedances	
				Low Concentration (mg/kg)	High Concentration (mg/kg)
Arsenic	9.79*	SD-13	5/5	18.8	41
		SD-21	1/5	24.6	24.6
		SD-31	5/5	30.2	60.3
		SD-34	5/5	22.2	207
		SD-37	5/5	22.4	58.8
		SD-52	4/5	12.4	34.3
		SD-69	3/5	10.2	13.1
		SD-103	5/5	12.1	21.2
Iron	20,000**	SD-34	1/5	29,700	29,700
		SD-37	1/5	22,300	22,300
Manganese	460**	SD-7	4/5	528	1,340
		SD-31	5/5	464	1,270
		SD-34	1/5	2,420	2,420
		SD-37	1/5	545	545
		SD-103	2/5	462	558

Notes:

*TEC: Threshold Effects Concentration. MacDonald, D.D., Ingersoll, C.G. and Berger, T.A. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

**EPA Region III. Freshwater Sediment Screening Benchmarks (FSSB), from : http://www.epa.gov/reg3hscd/risk/eco/btag/sbv/fwsed/screenbench.htm

TECs were used as the preferential source of sediment benchmarks.

Table 1: Comprehensive Surface Water Analytical Results (2006-2009)

Saco Municipal Landfill
Saco, Maine

	SW-13	SW-13	SW-13	SW-13	SW-13	SW-13	SW-21	SW-21	SW-21	SW-21	SW-21	SW-21
	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009	11/6/2009	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009	11/6/2009
	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Total Inorganic Analytes (ug/l)												
Aluminum					232J	<120U					272	<140U
Arsenic	<14.5U	6.6	17	30.2	19.4	15.8	<8.0U	<8.0	2.1	2.8J	<8UJ	<8.0
Barium					28.5	20.9					11.5	9.4
Calcium	16800		16100	25000	18900	16700	12500		9720	12100	10100	10200
Cobalt					0.23J	<30					<30UJ	<30
Copper					<25	<0.50U					1.1J	<25
Iron	1750J	1410	1890J	2670	1840	1470	901J	1040	858J	995	662	605
Lead					1.6J	<5.0					<5	<5.0
Magnesium	3110		3620	5400	3970	3260	2110		2090	2450	1920	1940
Manganese	460	224	546	966	667	415	98.3	65.9	116	91.2	96.9	31.1
Nickel					1.3J	<0.94U					<40	<40
Potassium					<3230U	3180					2030J	2590
Sodium					28000	22000					21900	17100
Vanadium					<25	<25					<25	<0.61U
Zinc					1.5J	<2.0U					2.4J	<2.4U

Notes:
* = maximum detected value or minimum reporting limit between primary and duplicate sample presented.
< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect
1. This table presents only those compounds detected at least once during the 2006-2009 sampling rounds.

Table 1: Comprehensive Surface Water Analytical Results (2006-2009)

Saco Municipal Landfill
Saco, Maine

	SW-31	SW-31	SW-31	SW-31*	SW-31	SW-31	SW-34	SW-34*	SW-34	SW-34	SW-34	SW-34
	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009	11/6/2009	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009	11/6/2009
	Primary	Primary	Primary	Primary/Dup 1	Primary	Primary	Primary	Primary/Dup 1	Primary	Primary	Primary	Primary
Total Inorganic Analytes (ug/l)												
Aluminum					<191U	<91.4U					<198U	<122U
Arsenic	<18.3U	4.9	12.8	13.2	12.2J	10.8	<15.7U	3.7	15.4	22.8	17.1	13.7
Barium					21.5	17.3					26.3	20.3
Calcium	19900		18500	27400	21300	19000	17800		16700	25300	19700	17200
Cobalt					<30	<30					<30U	<30
Copper					0.93J	<0.49U					0.92J	<0.62U
Iron	1380J	856	1130J	1160	1070	854	1660J	968	1600J	1880	1430	1230
Lead					1.5J	<5.0					1.6J	<5.0
Magnesium	3930		4270	6170	4560	4040	3340		3770	5500	4060	3490
Manganese	392	170	452	750	548	332	464	195	516	871	646	412
Nickel					0.89J	<0.80U					1.1J	<1.0U
Potassium					<3370U	3100					<3280U	3170
Sodium					27400	22900					27500	22600
Vanadium					<25	<25					<25	<25
Zinc					0.45J	<1.3U					2.9J	<1.4U

Notes:
* = maximum detected value or minimum reporting limit between primary and duplicate sample presented.
< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect
1. This table presents only those compounds detected at least once during the 2006-2009 sampling rounds.

Table 1: Comprehensive Surface Water Analytical Results (2006-2009)

Saco Municipal Landfill
Saco, Maine

	SW-37*	SW-37	SW-37	SW-37	SW-37*	SW-37*	SW-52	SW-52	SW-52*	SW-52	SW-52	SW-52
	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009	11/6/2009	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009	11/6/2009
	Primary/Dup 1	Primary	Primary	Primary	Primary/Dup 1	Primary/Dup 1	Primary	Primary	Primary/Dup 1	Primary	Primary	Primary
Total Inorganic Analytes (ug/l)												
Aluminum					225J	<110U					254J	<142U
Arsenic	<12.4U	7.6	17.7	26.9	18.8	15.4	<13.9U	4.8	15.4	29.6	25.4	14
Barium					27.6	22.2					27.9	19.7
Calcium	17500		16400	25000	19000	17000	15600		15200	23400	17400	15800
Cobalt					<30UJ	<30					0.21J	<30
Copper					6.5J	<0.82U					<25	<25
Iron	1680J	1300	1820J	2400	1620	1400	1590J	1400	1900J	2700	2810	1550
Lead					1.6J	<5.0					<5	<5.0
Magnesium	3230		3660	5370	3870	3570	2780		3290	4830	3470	3020
Manganese	473	217	545	961	652	440	356	168	444	820	562	337
Nickel					1.2J	0.91					0.9J	<0.93U
Potassium					<3120U	3250					<3000U	3080
Sodium					26900	23600					27100	22100
Vanadium					<25	<25					0.71J	<25
Zinc					1.6J	<1.6U					3.6J	<2.4U

Notes:
* = maximum detected value or minimum reporting limit between primary and duplicate sample presented.
< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect
1. This table presents only those compounds detected at least once during the 2006-2009 sampling rounds.

Table 1: Comprehensive Surface Water Analytical Results (2006-2009)

Saco Municipal Landfill
Saco, Maine

	SW-69	SW-69	SW-69	SW-69	SW-69	SW-69	SW-103	SW-103	SW-103	SW-103	SW-103	SW-103
	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009	11/6/2009	6/2/2006	10/31/2006	6/1/2007	6/20/2008	6/5/2009	11/6/2009
	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Total Inorganic Analytes (ug/l)												
Aluminum					<160U	<82.2U					<140U	<60.4U
Arsenic	<9.3U	<8.0	9.4	10.2	9J	7.2J	<14.0U	3.6	10.3	9.4	7.8J	7.1J
Barium					16.2	13.7					15.8	13.5
Calcium	21700		20100	28200	21800	19200	21600		20400	28600	22100	19600
Cobalt					<30U	<30					<30U	<30
Copper					<25	<0.59U					0.89J	<0.93U
Iron	1060J	634	918J	854	774	589	1040J	585	931J	813	727	519
Lead					<5	<5.0					1.5J	<5.0
Magnesium	4210		4570	6320	4600	3900	4260		4670	6450	4640	4070
Manganese	293	116	370	555	402	237	263	108	365	503	367	207
Nickel					0.65J	<0.68U					0.51J	<0.57U
Potassium					<3060U	2790					<3120U	2830
Sodium					23200	19200					23100	19900
Vanadium					<25	<25					<25	<25
Zinc					0.42J	<1.8U					4.6J	<1.1U

Notes:
* = maximum detected value or minimum reporting limit between primary and duplicate sample presented.
< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect
1. This table presents only those compounds detected at least once during the 2006-2009 sampling rounds.

TABLE 2
SUMMARY OF 2006-2009 SURFACE WATER ANALYTICAL RESULTS
Saco Municipal Landfill
Saco, Maine

Constituent[1]	CAS Number	Number of Detects	Number of Samples	Minimum Detected Concentration (µg/L)	Maximum Detected Concentration (µg/L)	Location and Collection Date of Maximum Concentration	USEPA Regional Screening Levels for Tapwater (µg/L)	Chemical[3] of Potential Concern for Surface Water?
Inorganics								
Aluminum	7429-90-5	4	16	225	272	SW-21 6/5/2009	37,000	No
Arsenic	7440-38-2	36	48	2.1	30.2	SW-13 6/20/2008	0.045	Yes
Barium	7440-39-3	16	16	9.4	28.5	SW-13 6/5/2009	7,300	No
Calcium	7440-70-2	40	40	9,720	28,600	SW-103 6/20/2008	NA	No (EN)
Cobalt	7440-48-4	2	16	0.21	0.23	SW-13 6/5/2009	11	Yes[4]
Copper	7440-50-8	5	16	0.89	6.5	SW-37 6/5/2009	1,500	No
Iron	7439-89-6	48	48	519	2,810	SW-52 6/5/2009	26,000	No (EN)
Lead	7439-92-1	5	16	1.5	1.6	SW-13 6/5/2009 SW-34 6/5/2009 SW-37 6/5/2009	15[2]	No
Magnesium	7439-95-4	40	40	1,920	6,450	SW-103 6/20/2008	NA	No (EN)
Manganese	7439-96-5	48	48	31.1	966	SW-13 6/20/2008	50[2]	Yes
Nickel	7440-02-0	8	16	0.51	1.3	SW-13 6/5/2009	730[5]	No
Potassium	7440-09-7	9	16	2,030	3,250	SW-37 11/6/2009	NA	No (EN)
Sodium	7646-69-7	16	16	17,100	28,000	SW-13 6/5/2009	NA	No (EN)
Vanadium	7440-62-2	1	16	0.71	0.71	SW-52 6/5/2009	2.6	Yes[4]
Zinc	7440-66-6	8	16	0.42	4.6	SW-103 6/5/2009	11,000	No

Notes:
NA = Not available
EN = Essential nutrient
1. Only compounds detected at least once in samples collected from 2006 through 2009 are summarized above.
2. Because a USEPA Regional Screening Level (RSL) for Tapwater is not available for this constituent, the Maximum Contaminant Level (MCL) was used.
3. A constituent was eliminated as a chemical of potential concern (COPC) if its maximum detected concentration was less than its RSL (or MCL, if not available) and/or if it was considered an essential nutrient (EN).
4. Because for a majority of the nondetect sample results the laboratory reporting limits were greater than the RSL, this compound was conservatively retained as a COPC.
5. Value for nickel soluble salts applied.

Table 3: Comprehensive Sediment Analytical Results (2006-2009)

Saco Municipal Landfill
Saco, Maine

	SD-13	SD-13	SD-13	SD-13	SD-21	SD-21	SD-21	SD-21	SD-31	SD-31	SD-31*
	6/2/2006	6/1/2007	6/20/2008	6/5/2009	6/2/2006	6/1/2007	6/20/2008	6/5/2009	6/2/2006	6/1/2007	6/20/2008
	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary/Dup 1
Total Inorganic Analytes (mg/kg)											
Aluminum				5840				7470			
Arsenic	18.8	30.8	39.8	41	24.6	4.7	4	5.3	59.5	58.8	60.3
Barium				34.6				41.9			
Beryllium				0.38J				0.51			
Cadmium				0.17J				0.13J			
Calcium				1060J				1910J			
Chromium				15.1				22.4			
Cobalt				3.1				4.1			
Copper				6.5				8			
Iron	11600	10200	10900	12600	9700	7400	6900	13400	10800	10600	10300
Lead				6.2				5.8			
Magnesium				2600J				4800J			
Manganese	120	232	190	187	231	304	203	238	1030	954	1270
Mercury				<0.043UJ				<0.029UJ			
Nickel				13.3				15.6			
Potassium				1010J				1830J			
Silver				<1.5UJ				<1.4UJ			
Sodium				<89.6U				134			
Thallium				<1.5				0.28J			
Vanadium				12.2				20.9			
Zinc				30.2				33.3			

Notes:
* = maximum detected value or minimum reporting limit between primary and duplicate sample presented.
< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect
1. This table presents only those compounds detected at least once during the 2006-2009 sampling rounds.

Table 3: Comprehensive Sediment Analytical Results (2006-2009)

Saco Municipal Landfill
Saco, Maine

	SD-31	SD-34	SD-34	SD-34	SD-34	SD-37*	SD-37	SD-37	SD-37*	SD-52
	6/5/2009	6/2/2006	6/1/2007	6/20/2008	6/5/2009	6/2/2006	6/1/2007	6/20/2008	6/5/2009	6/2/2006
	Primary	Primary	Primary	Primary	Primary	Primary/Dup 1	Primary	Primary	Primary/Dup 1	Primary
Total Inorganic Analytes (mg/kg)										
Aluminum	3950				5640				4550	
Arsenic	32.5	32.1	36.6	207	56.3	34.4	22.4	50.8	39.3	<3.9U
Barium	42.6				44.1				40.9	
Beryllium	0.29J				0.43				0.45J	
Cadmium	0.12J				0.19				0.15J	
Calcium	1040J				1090J				1110J	
Chromium	7				12.4				9.9	
Cobalt	2.8J				3.2				2.3	
Copper	3				4.9				4.6	
Iron	7350	15600	7470	29700	13600	26300	8490	9720	9990	4640
Lead	4				5.8				6.1	
Magnesium	1440J				2390J				1500J	
Manganese	1020	329	307	2420	438	315	307	136	545	104
Mercury	<0.032UJ				<0.037UJ				<0.041UJ	
Nickel	6.2				10				7.2	
Potassium	565J				1000J				938	
Silver	0.12J				<1.3UJ				0.15J	
Sodium	<86.9U				<157U				<70.3U	
Thallium	<1.8				<1.3				<1.9	
Vanadium	7.1				11.8				10.3	
Zinc	25.8				36.8				31.2	

Notes:
* = maximum detected value or minimum reporting limit between primary and duplicate sample presented.
< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect
1. This table presents only those compounds detected at least once during the 2006-2009 sampling rounds.

Table 3: Comprehensive Sediment Analytical Results (2006-2009)

Saco Municipal Landfill
Saco, Maine

	SD-52*	SD-52	SD-52	SD-69	SD-69	SD-69	SD-69	SD-103	SD-103	SD-103	SD-103
	6/1/2007	6/20/2008	6/5/2009	6/2/2006	6/1/2007	6/20/2008	6/5/2009	6/2/2006	6/1/2007	6/20/2008	6/5/2009
	Primary/Dup 1	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Total Inorganic Analytes (mg/kg)											
Aluminum			7020				2590				3750
Arsenic	15.9	12.4	34.3	8.5	13.1	10.9	7.3	21.2	12.1	17.6	13.2
Barium			38.9				12.4				21.7
Beryllium			0.59				0.21J				0.28J
Cadmium			0.17				<0.05U				<0.08U
Calcium			1420J				606J				638J
Chromium			10.6				5.1				6.5
Cobalt			2.6J				1.3				2.1J
Copper			5.3				<2.5U				3.1
Iron	9880	5890	11200	3970	5060	4310	3570	19300	5040	11900	5240
Lead			9.3				2				3.5
Magnesium			1770J				1020J				1280J
Manganese	306	71.4	313	102	222	77.1	185	558	348	311	462
Mercury			0.02J				<0.038UJ				<0.04UJ
Nickel			6.6				4.8				5.6
Potassium			1050J				423J				526J
Silver			<1.3UJ				<1.7UJ				0.09J
Sodium			<153U				<44.6U				<68U
Thallium			<1.3				<1.7				<1.6
Vanadium			12				5				7.4
Zinc			39.4				13.5				18.3

Notes:
* = maximum detected value or minimum reporting limit between primary and duplicate sample presented.
< = not detected at reporting limit
- = not analyzed
J = estimated
U = revised to non-detect
1. This table presents only those compounds detected at least once during the 2006-2009 sampling rounds.

TABLE 4
SUMMARY OF 2006-2009 SEDIMENT ANALYTICAL RESULTS
Saco Municipal Landfill
Saco, Maine

Constituent[1]	CAS Number	Number of Detects	Number of Samples	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Location and Collection Date of Maximum Concentration	USEPA Regional Screening Levels for Residential Soil (mg/kg)	Chemical[2] of Potential Concern for Sediment?
Inorganics								
Aluminum	7429-90-5	8	8	2,590	7,470	SD-21 6/5/2009	77,000	No
Arsenic	7440-38-2	31	32	4.0	207	SD-34 6/20/2008	0.39	Yes
Barium	7440-39-3	8	8	12.4	44.1	SD-34 6/5/2009	15,000	No
Beryllium	7440-41-7	8	8	0.21	0.59	SD-52 6/5/2009	160	No
Cadmium	7440-43-9	6	8	0.12	0.19	SD-34 6/5/2009	70	No
Calcium	7440-70-2	8	8	606	1,910	SD-21 6/5/2009	NA	No (EN)
Chromium	7440-47-3	8	8	5.1	22.4	SD-21 6/5/2009	120,000[3]	No
Cobalt	7440-48-4	8	8	1.3	4.1	SD-21 6/5/2009	23	No
Copper	7440-50-8	7	8	3.0	8.0	SD-21 6/5/2009	3,100	No
Iron	7439-89-6	32	32	3,570	29,700	SD-34 6/20/2008	55,000	No
Lead	7439-92-1	8	8	2.0	9.3	SD-52 6/5/2009	400	No
Magnesium	7439-95-4	8	8	1,020	4,800	SD-21 6/5/2009	NA	No (EN)
Manganese	7439-96-5	32	32	71.4	2,420	SD-34 6/20/2008	1,800	Yes
Mercury	7439-97-6	1	8	0.02	0.02	SD-52 6/5/2009	5.6	No
Nickel	7440-02-0	8	8	4.8	15.6	SD-21 6/5/2009	1,500[4]	No
Potassium	7440-09-7	8	8	423	1,830	SD-21 6/5/2009	NA	No (EN)
Silver	7440-22-4	3	8	0.09	0.15	SD-37 6/5/2009	390	No
Sodium	7646-69-7	1	8	134	134	SD-21 6/5/2009	NA	No (EN)
Thallium	7440-28-0	1	8	0.28	0.28	SD-21 6/5/2009	NA	Yes
Vanadium	7440-62-2	8	8	5.0	20.9	SD-21 6/5/2009	5.5	Yes
Zinc	7440-66-6	8	8	13.5	39.4	SD-52 6/5/2009	23,000	No

Notes:
NA = Not available
EN = Essential nutrient
1. Only compounds detected at least once in samples collected from 2006 through 2009 are summarized above.
2. A constituent was eliminated as a chemical of potential concern if its maximum detected concentration was less than its USEPA Regional Screening Level or if it was considered an essential nutrient (EN).
3. Value for chromium (III), insoluble salts applied.
4. Value for nickel soluble salts applied.

APPENDICES

Nobis Engineering, Inc.
18 Chenell Drive
Concord, NH 03301
Tel (603) 224-4182
Fax (603) 224-2507
www.nobisengineering.com

EPA Region 1 RAC 2 Contract No. EP-S1-06-03

July 12, 2010
Nobis Project No. 80020

Via Electronic Submittal

U.S. Environmental Protection Agency, Region 1
Attention: Ms. Leslie McVickar, Task Order Project Officer
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3919

Subject: Transmittal of the Spring 2010 Inspection Report
Saco Municipal Landfill Superfund Site (Areas 3 & 4), Saco, Maine
Long-Term Response Action Oversight
Task Order Number 0020-AN-GM-01B9

Dear Ms. McVickar:

Attached with this correspondence is the Spring 2010 Inspection Report for the landfill inspection conducted on May 20, 2010 at the Saco Municipal Landfill Superfund Site (Areas 3 & 4).

Should you have any questions or comments, please contact me at (603) 724-6236, or by email at cadams@nobisengineering.com.

Sincerely,

NOBIS ENGINEERING, INC.

J. Christopher Adams, P.E.
Project Manager

Attachments

c: File 80020/NH

SEMI-ANNUAL INSPECTION REPORT
SACO MUNICIPAL LANDFILL SUPERFUND SITE (AREAS 3 & 4)
SACO, MAINE

1.0 INTRODUCTION

This report documents and presents observations made by Nobis Engineering, Inc. (Nobis) during the Spring Inspection of the Saco Municipal Landfill Superfund Site (Areas 3 and 4) (Site) in Saco, Maine conducted on May 20, 2010. This Site consists of four distinct landfill areas, 1 to 4, surrounded by wooded areas. Landfill areas 1 and 2 have been converted to recreational ball fields and only areas 3 and 4 are included in this Site inspection.

The inspection included the following activities:

- Walking the perimeter and top of the landfill cap to look for evidence of erosion, cap disturbance, settlement, and poor growth of vegetation;
- Inspecting the on-and-off-cap storm water control structures for damage, settlement, sedimentation, vegetation, and blockage; and
- Inspecting the above ground portions of structures that penetrate the cap (i.e., gas vents, etc.) for damage.

A site-specific inspection checklist was used to document the inspection and is provided in Attachment 1. This report is based on visual inspections with reference to the as-built drawings of the cover system installation. The evaluation of subsurface conditions was not within the scope of this inspection. Observations made during the inspection are summarized below.

2.0 SUMMARY OF INSPECTION

The results of the Site inspection are presented according to the various components of the landfill cover system. Where appropriate, current conditions are compared to those observed in prior inspections. The following sections of the report correspond to the inspection items listed in the checklist. References to Site Features (e.g. benches, gas vents, letdown channels) and current conditions observed are shown on Figure 1 (included as part of Attachment 1). Photos documenting observations during the inspection are provided in Attachment 2. A panoramic view of the landfill cap is shown in Photo 1 (Attachment 2).

Landfill Surface

During the inspection of the perimeter and top of the landfill cap, the Nobis inspector observed several areas of thin vegetation (see Figure 1). Some locations were first observed in prior inspections; these are noted as having been repaired, or still present, as appropriate. In general, grass conditions were difficult to evaluate as mowing has not yet taken place and grass is as much as twelve inches long in some locations. The noted observations should be rechecked after mowing and during the Fall 2010 inspection.

- Areas of thin vegetation observed during the Spring 2010 and prior inspections included the following:

    - Newly observed during this inspection are a hole and mounded grass on the uphill side of the lowest bench, to the east of the southeastern downdrain. This could be a woodchuck hole or erosion, and should be filled and seeded (see Figure 1, Item 1, and Photo 2).

    - Much of the landfill slope to the east of the southeastern downdrain, between the lower two benches, has bare patches, observed in Fall 2009 and still present, that should be provided with topsoil and seed (see Figure 1, Item 2, and Photo 3).

    - Thin grass and bare patches were observed alongside the southeastern downdrain just above the sump at the base of the downdrain. This area should be provided with topsoil and seed (see Figure 1, Item 3, and Photo 4).

    - During the Fall 2009 inspection, the inspector observed several areas of bare ground on the southwestern face of the landfill that are still present: one patch near Gas Vent (GV)-4, one directly below GV-4 on the downhill side of the lower bench, and one directly below GV-3 on the downhill side of the lower bench (see Figure 1, Item 4, and Photo 5). These areas should be provided with topsoil and seed.

    - An additional bare patch observed in Fall 2009 near GV-4 is no longer present.

- A large area of thin grass was observed during the Fall 2009 inspection between GV-3 and the "Mason-Dixon Line," and is still present as identified on Figure 1 (see Figure 1, Item 5, and Photo 6). This area should be seeded.

- During previous inspections, a bare patch was observed near the top of the landfill's lowest face, to the west of Culvert 4's outlet into the sedimentation basin. This had been repaired as of the Fall 2009 inspection, but grass growth was still in progress. Growth is complete as of the Spring 2010 inspection (see Figure 1, Item 6, and Photo 7).

- Thin vegetation and bare patches, first observed in prior inspections, continue to occur throughout the landfill along the bench limits (see Figure 1, Items 7 and 8, and Photo 8). These areas should be seeded.

- In the Fall of 2009, the inspector observed grass growing in clumps along the slope between the lowest and second lowest benches, near the northern end of the landfill. There were no obvious growth problems; however, the grass has not been mowed recently so it is difficult to evaluate. Conditions in this area should be observed after mowing, and if necessary this area should be provided with additional fill and seed (see Figure 1, Item 9).

- In the Fall of 2008, a slope failure repair was made on the northern face of the landfill cap between GV-11 and GV-12. Grass cover has been insufficient in this area. The area should be reseeded and monitored to ensure vegetative cover is established (see Figure 1, Item 10, and Photo 9).

- During the Fall 2009 inspection, an area of erosion was observed on the uphill side of the highest bench at the top of the southeastern downdrain, During the Spring 2010 inspection, conditions were observed to have deteriorated with some holes developing that were not previously present (see Figure 1, Item 11, and Photo 10);

- On the uphill side of the bench upslope of GV-20, there is erosion on the landfill slope. This was observed in the Fall 2009 inspection and is still present with no changes (see Figure 1, Item 12 and Photo 11);

- Newly observed during this inspection is an area of apparent erosion, near GV-5, that begins approximately halfway between the top bench and the next downslope bench, and is approximately one inch wide and three inches deep. The downstream point of the erosion is at the second highest bench. No obvious cause was visible, but the inspector noted that there is an underdrain that passes approximately underneath the upper limits of erosion (see Figure 1, Item 13 and Photo 12);

- A small area of slight settling observed in prior inspections near the upper corner of the eastern side of the sump discharging to the sedimentation basin should be monitored for additional settlement (see Figure 1, Item 14 and Photo 13). Soil in this area also shows signs of erosion. Conditions appear to be slightly worse than observed during the Fall 2009 inspection;

- A woodchuck hole observed in Spring 2009 above the lowest bench, to the west of the southeastern downdrain, could not be located either in this inspection or the Fall 2009 inspection. The inspector did not observe any signs of recent repair; however, tall grass conditions may have hidden the hole. The inspector will attempt to locate this hole during the next inspection (see Figure 1, Item 15); and

- During the Spring 2009 inspection, the inspector observed a hole located near GV-8 on the top level of the landfill, which is at the center of an area of settling. This hole was still present in the Fall 2009 inspection, but could not be located in the Spring 2010 inspection. Tall grass may have hidden the hole; an attempt to locate it will be made during the next inspection (see Figure 1, Item 16).

Benches

Minor sedimentation and vegetation growth were present in three locations during the Fall 2009 inspection, and all but one is still present as of the Spring 2010 inspection. Vegetation that was present in the bench immediately below GV-3 in Fall 2009 has been removed. The two remaining locations are indicated on Figure 1 (Items 17 and 18): one is in the bench upslope of and between GV-18 and GV-19 (see Figure 1, Item 17 and Photo 14), and the other is in the

bench upstream of the Culvert 2 inlet between the area just below GV-19 and the entrance to the culvert (see Figure 1, Item 18, and Photo 15).

During prior inspections, the inspector observed a possible bulge and water seepage along the lowest bench near the western tip of the landfill, below GV-1 and GV-2. This area appears to be stable; however, the inspector observed three drain pipe outlets at this location that should be cleaned. Two of them were observed in prior inspections and the third was newly-observed in the Spring 2010 inspection. Clearing of drain outlets should be a regular component of landfill maintenance (see Figure 1, Item 19 and Photo 16).

Newly-observed during this inspection was standing water in the lowest bench at the eastern tip of the landfill. Typically standing water is not observed in benches; presence of this water could be from recent rain activity, but should be monitored for reoccurrence (see Figure 1, Item 20 and Photo 17).

An additional item that was newly-observed during this inspection was pockets of missing riprap near the edge of the lowest bench at the southern tip of the landfill. It is unknown if this is animal activity or erosion. This riprap should be replaced and monitored for signs of further disturbance (see Figure 1, Item 21 and Photo 18).

The benches were otherwise in good condition with no additional signs of erosion, undermining, bypass, breaching, or ponded water.

Letdown Channels (Downdrains)

The gabion-lined letdown channels on the east end and northeast slope of the landfill were in good condition with no signs of settlement, material degradation, erosion, undercutting, or obstructions. The sump between the southeastern downdrain and the sedimentation basin (see Photo 19) appears to be in good condition with no obstructions. Photo 20 shows the southeastern downdrain, looking downslope towards the sedimentation basin.

Cover Penetrations

Cover penetrations through the landfill cover system include 20 passive gas vent structures (GV-1 through GV-20) (See Figure 1 for locations). Most of the riser pipes are leaning down

slope at various degrees of tilt, which is most likely caused by landfill settlement. The tilt does not appear to be impacting the effectiveness of the vents as no crimping or other structural deformity was noted. Gas vent tilt has not increased since the Fall 2009 inspection. The vents were otherwise found to be in good condition. Photo 21 shows GV-14.

Monitoring Wells

The monitoring wells immediately adjacent to the landfill were inspected for signs of damage and assessed for continued security. The wells were contained in protective standpipes with locked caps. The protective standpipes for the monitoring wells appeared to be secure and in good condition as evidenced by the integrity of the standpipes. Protective standpipes were not opened to determine the integrity of the monitoring wells. Photo 22 shows monitoring wells on the eastern edge of the sedimentation basin.

Cover Drainage Layer

The outlet pipes and riprap outlet zone of the drainage layer at the perimeter of the cover system appeared to be in good condition all around the landfill. No apparent damage to the outlet pipes or displacement of the riprap was observed. As noted during the Fall 2009 inspection, rodent guards are not present on all of the pipes.

Sedimentation Basin

The sedimentation basin and outlet structures appeared to be in good condition and well-maintained. As observed during the Fall 2009 inspection, the outlet of Culvert 3 appears to be surrounded by dead vegetation, and hay bales surround the area around the outlet (see Figure 1, Item 22 and Photo 23). Additional dead vegetation surrounds the outlet of an upstream riprap channel that discharges into the sedimentation basin near the outlet of Culvert 3.

Also observed during the Fall 2009 inspection was the vegetation surrounding the outlet pipe that discharges the sump between the southeastern downdrain and the sedimentation basin. This vegetation has been removed, but should be monitored for future growth (see Figure 1, Item 23 and Photo 24).

Retaining Walls

No significant bulging or tilting was observed in the gabion baskets forming the retaining structure at the bottom of the downdrain on the east end of the landfill.

Perimeter Ditches and Off-Site Discharge

The perimeter ditches were in good condition at the time of the inspection. All of the drainage culverts appeared to be in good condition.

Perimeter Roads

The perimeter roads were in good condition with no signs of erosion, ruts or potholes. Granite blocks continue to be stockpiled off the northwestern perimeter access road. There is no fencing around the landfill perimeter.

3.0 CORRECTIVE ACTIONS

This section describes the status of previously-recommended corrective actions and provides recommendations for further actions.

- The City should continue to add topsoil and seed to areas of thin vegetation, erosion, and woodchuck holes indentified in the Landfill Surface section above (see Figure 1, Items 1 – 13, and 15 – 16). Some areas have been repaired but need additional topsoil and seed to promote healthy growth. Other areas noted in this inspection have been noted previously; they should be monitored for future vegetation disturbance.

- Vegetation removal from benches and around culvert inlets/outlets should continue, and these areas should be monitored on a regular basis for future growth (see Figure 1, Items 17 – 19, and 22).

- During prior inspections, the inspector noted that the site of the slope failure repair between GV-11 and GV-12 on the northern face, which took place in Fall 2008, had sparse grass cover. This area needs additional fill and seed, and to be monitored to ensure vegetative cover is established (see Figure 1, Item 10).

4.0 RECOMMENDATIONS

The following corrective actions are recommended based on the observations made during the Spring 2010 inspection:

- Topsoil and seed should be added to areas of thin vegetation, identified in Section 2.0 – Landfill Surface above (see Figure 1, Items 1 through 10), and monitored for future vegetation disturbance. Woodchuck holes, erosion, and mower damage should be repaired (see Figure 1, Items 11, 12, 13, 15, and 16).

- Missing riprap from edge of lower bench near southern tip of landfill should be replaced (see Figure 1, Item 21).

- Tilt of gas vents has not increased since the Fall 2009 inspection; however, tilt should continue to be monitored for signs of potential increase or other indication of movement/settlement that could contribute to malfunction.

- Dead vegetation near the outlet of Culvert 3 in the sedimentation basin should be removed. Hay bales should also be removed (see Figure 1, Item 22).

- Dead vegetation growth in the channel that discharges into the sedimentation basin near the outlet of Culvert 3 in the sedimentation basin should be removed (see Figure 1, Item 22).

- Sedimentation and vegetation as noted in the landfill benches should be removed (see Figure 1, Items 17 and 18).

- Drain outlets along the landfill perimeter should be cleaned in the areas noted, and drain outlets throughout the landfill should be kept free of obstructions as part of regular maintenance (see Figure 1, Item 19).

Attachment 1

Inspection Checklist and Site Plan
May 20, 2010

Nobis

EPA RAC Contract # EP-S1-06-03

SEMI-ANNUAL LANDFILL INSPECTION CHECKLIST

Task Order:	**0020-AN-GM-01B9**	**Weather:**	Sunny
Site Name:	**Saco Municipal Landfill**	**Temperature:**	75°F
Town:	**Saco**	**Site Map:**	**Attach Map**
State:	**Maine**	**Date of Inspection:**	5/20/10 12:30pm
PRP Representatives:	None		
Inspection Team:	Brian Waehler (Nobis)		

ITEM	REMARKS
LANDFILL SURFACE	
1. SETTLEMENT (LOW SPOTS) Yes ☒ No ☐ Location (indicate on site map): Areal Extent: Depth:	slight near upper corner of eastern side of sed. basin sump (unchanged)
2. CRACKS Yes ☐ No ☒ Location (indicate on site map): Length: Width: Depth:	
3. EROSION Yes ☒ No ☐ Location (indicate on site map): Areal Extent: Depth:	- uphill side of top bench near top of downchute - uphill side of bench uphill of GV-20 - uphill side of bench near sump of sed. basin - upper bench near GV-5
4. HOLES Yes ☒ No ☐ Location (indicate on site map): Areal Extent: Depth: Suspected Cause (rodent or other):	None visible except as noted under erosion
5. VEGETATIVE COVER Yes ☒ No ☐ Grass: Condition: Trees/Shrubs: Yes ☐ No ☒ Location (indicate on site map): Size:	Various areas of thin veg / bare particles, see map grass 1' long, hard to evaluate
6. ARMORED COVER Yes ☐ No ☒ Material Type: Condition:	
7. BULGES Yes ☐ No ☒ Location (indicate on site map): Areal Extent: Height: Suspected Cause (gas pressure or other):	

Nobis

EPA RAC Contract # EP-S1-06-03

ITEM		REMARKS
8. WET AREAS Ponding: Location (indicate on site map): Areal Extent: Seeps: Location (indicate on site map): Areal Extent: Estimated Flow Rate: Soft Subgrade: Location (indicate on site map): Areal Extent:	Yes ☐ No ☒ Yes ☐ No ☒ Yes ☐ No ☒	
9. SLOPE INSTABILITY Slides: Location (indicate on site map): Areal Extent: Probable Slide Interface: Suspected Cause: Exposed Cover Components:	Yes ☐ No ☒	
BENCHES		
1. FLOW BYPASS BENCHES Location (indicate on site map): Description of Problem:	Yes ☒ No ☐	Bench A ☒ B ☒ C ☒ D ☒ E ☒ F ☒ G ☐ H ☒ I ☒ — minor sl)/rel see mgr
2. BENCH BREACHED Location (indicate on site map): Description of Problem:	Yes ☐ No ☒	
3. SETTLEMENT Location (indicate on site map): Areal Extent: Depth:	Yes ☒ No ☐	missing riprap bench C near GV-10

Nobis

EPA RAC Contract # EP-S1-06-03

ITEM		REMARKS
LETDOWN CHANNELS		
1. SETTLEMENT Location (indicate on site map): Areal Extent: Depth:	Yes ☐ No ☒	
2. MATERIAL DEGRADATION Material Type: Location (indicate on site map): Areal Extent: Degree of Degradation:	Yes ☐ No ☑	
3. EROSION Location (indicate on site map): Areal Extent: Depth:	Yes ☐ No ☒	
4. UNDERCUTTING Location (indicate on site map): Areal Extent: Depth:	Yes ☐ No ☒	
5. OBSTRUCTIONS Type: Location (indicate on site map): Areal Extent: Size:	Yes ☐ No ☒	
6. VEGETATIVE GROWTH Type: Location (indicate on site map): Areal Extent:	Yes ☐ No ☒	
COVER PENETRATIONS		
1. GAS VENTS Located: Functioning: Condition:	Active Passive Yes ☒ No ☐ Yes ☒ No ☐	tilting unchanged since F2009
2. GAS MONITORING PROBES Located: Functioning: Condition:	Yes ☐ No ☒ Yes ☐ No ☒ Yes ☐ No ☐	
3. MONITORING WELLS Located: Functioning: Condition:	Yes ☒ No ☐ Yes ☒ No ☐ Yes ☐ No ☐	wells have locked caps Did not observe any wells without locks

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EPA RAC Contract # EP-S1-06-03

ITEM		REMARKS
COVER DRAINAGE LAYER		
1. OUTLET PIPES Functioning: Condition:	Yes ☒ No ☐ Yes ☒ No ☐	- sed/veg near culvert 2 - veg near downdrain culvert - dead veg/haybales near culvert 3
2. OUTLET ROCK Functioning: Condition:	Yes ☒ No ☐ Yes ☒ No ☐	
3. RODENT GUARDS Present:	Yes ☐ No ☒ Yes ☐ No ☒	
DETENTION/SEDIMENTATION PONDS		
1. SILTATION Areal Extent:	Yes ☐ No ☒ Depth:	
2. EROSION Areal Extent:	Yes ☐ No ☒ Depth:	
3. OUTLET WORKS Functioning: Condition:	Yes ☒ No ☐ Yes ☒ No ☐	- dead veg/haybales, culvert 3 - veg downdrain outlet
4. DAM Functioning: Condition:	Yes ☐ No ☒ Yes ☐ No ☒	
RETAINING WALLS (Bottom of Downdrain)		
1. DEFORMATIONS Location (indicate on site map): Horizontal Displacement: Vertical Displacement: Rotational Displacement:	Yes ☐ No ☒	
2. DEGRADATION Location (indicate on site map): Description of Damage:	Yes ☐ No ☒	
GROUNDWATER SYSTEMS		
1. OFF-CAP MONITORING WELLS Damage:	Yes ☐ No ☒	

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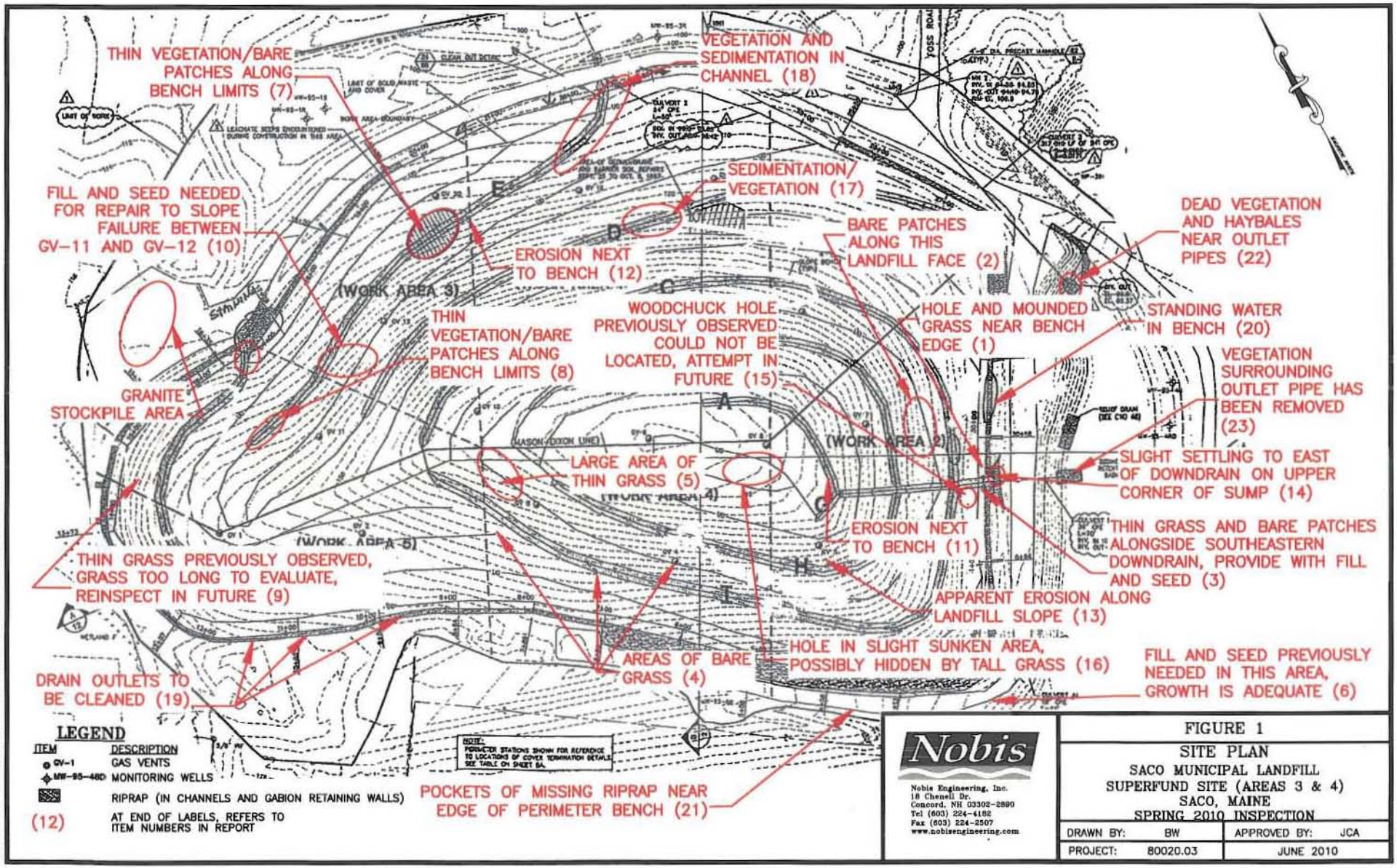
EPA RAC Contract # EP-S1-06-03

ITEM		REMARKS	
PERIMETER DITCHES/OFF-SITE DISCHARGE			
1. SILTATION Location (indicate on site map): Areal Extent: Depth:	Yes ☐ No ☒	Culvert 1 ☒ Culvert 2 ☒ Culvert 3 ☒ Culvert 4 ☐ Manhole 1 ☐ Manhole 2 ☐	- checked culverts have veg. near inlet/outlet
2. VEGETATION GROWTH Location (indicate on site map): Areal Extent: Type:	Yes ☒ No ☐		
3. EROSION Location (indicate on site map): Areal Extent: Depth:	Yes ☐ No ☒		
4. DISCHARGE STRUCTURE Functioning: Condition:	Yes ☒ No ☐ Yes ☒ No ☐		
FENCING			
1. FENCING DAMAGE Location (indicate on site map): Description of Damage:	Yes ☐ No ☒		
PERIMETER ROADS			
1. ROADS DAMAGED Location (indicate on site map): Description of Damage:	Yes ☐ No ☒		
SITE ACCESS			
1. ACCESS RESTRICTION	Yes ☐ No ☒	transfer station / ballfields near site	
GENERAL			
1. VANDALISM Location (indicate on site map): Description of Damage:	Yes ☐ No ☒		
2. CHANGED SITE CONDITION	Yes ☐ No ☒		

INTERVIEWS (conduct interviews if the following are present during inspection)

1. INTERVIEW WORKERS ON SITE N/A
   Problems:
   Suggestions:
   Attach Report

ITEM	REMARKS
2. INTERVIEW SITE NEIGHBORS Problems: Suggestions: *Attach Report*	N/A
3. INTERVIEW LOCAL OFFICIALS Problems: Suggestions: *Attach Report*	
REVIEW DOCUMENTS	
1. GROUNDWATER MONITORING RECORDS Abnormalities:	N/A
2. LANDFILL CLOSURE PROGRESS REPORT Report Date: Abnormalities:	
3. OPERATION AND MAINTENANCE PLAN Is there a plan in place? Yes ☐ No ☐ Is it being followed? Yes ☐ No ☐ Is it adequate? Yes ☐ No ☐	


THIN VEGETATION/BARE PATCHES ALONG BENCH LIMITS (7)
VEGETATION AND SEDIMENTATION IN CHANNEL (18)
FILL AND SEED NEEDED FOR REPAIR TO SLOPE FAILURE BETWEEN GV-11 AND GV-12 (10)
SEDIMENTATION/ VEGETATION (17)
EROSION NEXT TO BENCH (12)
BARE PATCHES ALONG THIS LANDFILL FACE (2)
DEAD VEGETATION AND HAYBALES NEAR OUTLET PIPES (22)
(WORK AREA 3)
THIN VEGETATION/BARE PATCHES ALONG BENCH LIMITS (8)
WOODCHUCK HOLE PREVIOUSLY OBSERVED COULD NOT BE LOCATED, ATTEMPT IN FUTURE (15)
HOLE AND MOUNDED GRASS NEAR BENCH EDGE (1)
STANDING WATER IN BENCH (20)
VEGETATION SURROUNDING OUTLET PIPE HAS BEEN REMOVED (23)
GRANITE STOCKPILE AREA
(WORK AREA 2)
SLIGHT SETTLING TO EAST OF DOWNDRAIN ON UPPER CORNER OF SUMP (14)
LARGE AREA OF THIN GRASS (5)
(WORK AREA 4)
(WORK AREA 5)
EROSION NEXT TO BENCH (11)
THIN GRASS AND BARE PATCHES ALONGSIDE SOUTHEASTERN DOWNDRAIN, PROVIDE WITH FILL AND SEED (3)
THIN GRASS PREVIOUSLY OBSERVED, GRASS TOO LONG TO EVALUATE, REINSPECT IN FUTURE (9)
APPARENT EROSION ALONG LANDFILL SLOPE (13)
HOLE IN SLIGHT SUNKEN AREA, POSSIBLY HIDDEN BY TALL GRASS (16)
FILL AND SEED PREVIOUSLY NEEDED IN THIS AREA, GROWTH IS ADEQUATE (6)
AREAS OF BARE GRASS (4)
DRAIN OUTLETS TO BE CLEANED (19)
POCKETS OF MISSING RIPRAP NEAR EDGE OF PERIMETER BENCH (21)
LEGEND
ITEM DESCRIPTION
GV-1 GAS VENTS
MW-95-48D MONITORING WELLS
RIPRAP (IN CHANNELS AND GABION RETAINING WALLS)
(12) AT END OF LABELS, REFERS TO ITEM NUMBERS IN REPORT
NOTE: PERIMETER STATIONS SHOWN FOR REFERENCE TO LOCATIONS OF COVER TERMINATION DETAILS SEE TABLE ON SHEET 8A.
Nobis
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www.nobisengineering.com
FIGURE 1
SITE PLAN
SACO MUNICIPAL LANDFILL
SUPERFUND SITE (AREAS 3 & 4)
SACO, MAINE
SPRING 2010 INSPECTION
DRAWN BY: BW
APPROVED BY: JCA
PROJECT: 80020.03
JUNE 2010

INTERVIEW RECORD

Site Name: Saco Tannery Municipal Landfill		**EPA ID No.:**
Subject: Five-year review		**Time: 11.00 am** **Date: 6/9/2010**
Type: Telephone Visit Other X email **Location of Visit:** Foss Road, Saco, Tannery		Incoming X Outgoing X
Contact Made By:		
Name: Leslie McVickar	**Title:** Project Manager	**Organization:** US EPA
Individual Contacted:		
Name: Various (see sign in sheet)	**Title:** N/A	**Organization:** Various (see sign in sheet)
Telephone No: (sign in sheet) **Fax No:** **E-Mail Address:**	**Street Address:** Foss Road **City, State, Zip:** Saco, Maine	

Summary Of Conversation

Interviews were conducted concurrently with the Site Inspection. A sign in sheet (attached) was used to record the names of the individuals interviewed. All persons in attendance were given the opportunity to ask questions and comment on the condition of the remedy. There were no concerns or comments on the condition of the Site and the Operation and Maintenance of the Site. All in attendance commented that the landfill cap was in very good condition and there were no significant concerns.

EVALUATION OF POTENTIAL HEALTH RISKS ASSOCIATED WITH WADING IN SANDY BROOK

SACO MUNICIPAL LANDFILL SUPERFUND SITE

SUPPLEMENTAL RISK ASSESSMENT
CONDUCTED BY WOODARD & CURRAN
IN SUPPORT OF THE SECOND FIVE-YEAR REVIEW AT THE SITE

JULY 2010

Trespasser Risk Assessment

As requested by the USEPA, Woodard & Curran, Inc. has performed an evaluation of potential health risks associated with wading in Sandy Brook by a youth trespasser, ages 11-15 years. This risk assessment was based on standard USEPA methodology for Superfund Risk Assessment (e.g., Risk Assessment Guidance for Superfund Sites or "RAGS," 1989 et seq.) and relied on assumptions provided by USEPA Region 1 during a teleconference on June 24, 2010 and default assumptions provided in USEPA policies and guidance documents. A complete reference list is provided at the end of this memorandum.

This assessment entailed evaluation of dermal contact with and incidental ingestion of surface water and sediment within the portion of the Sandy Brook proximate to Saco Municipal Landfill Superfund Site Areas 2 and 4. To provide the most representative assessment of this scenario, the relevant portion of the Sandy Brook was considered a single exposure point, permitting use of a robust data set to estimate exposure point concentrations (EPCs), as described in more detail below. As indicated in the risk characterization portion of this memorandum, the estimated non-cancer risk for the receptor is 0.1, below the USEPA risk management criterion of 1. The estimated cancer risk is 4×10^{-6}, within the USEPA risk management range of 1×10^{-4} to 1×10^{-6}.

A brief description of the methodology and assumptions used in the risk assessment is provided in the remainder of this memorandum below.

Hazard Identification

Woodard & Curran reviewed the surface water and sediment data collected from Sandy Brook during a series of monitoring events that were conducted between June 2001 and November 2009. These media were analyzed for various inorganic analytes throughout that time period. Data collected from upstream/background location SW-7 (surface water) and SD-7 (sediment) were excluded from consideration in the risk assessment.

A review of the trend analysis performed for these media revealed that concentrations of the primary constituents of potential concern (COPC), arsenic, manganese and iron, are typically stable or decreasing over time (Woodard & Curran, 2010). Therefore, to provide a representative assessment of current and potential future conditions in Sandy Brook, Woodard & Curran selected data collected between 2006 and 2009 for evaluation in the risk assessment. The 2006 through 2009 surface water data are summarized on Table 1 with summary statistics and COPC selection provided on Table 2 and the 2006 through 2009 sediment data are summarized on Table 3 with summary statistics and COPC selection provided on Table 4. Constituents were selected as COPCs if their maximum detected concentration exceeded the USEPA Regional Screening Level (RSL; USEPA, 2010). For surface water, if an RSL was not available, the Maximum Contaminant Level (MCL; USEPA, 2009) was used. If neither an RSL nor MCL was available, the constituent was retained as a COPC. Additionally, because laboratory reporting limits (LRLs) for cobalt and vanadium in surface water were greater than the RSL for these constituents, they were conservatively retained as COPC despite the fact that their maximum detected concentration was below the RSL.

Exposure Assessment

The youth trespasser was assumed to be exposed to surface water and sediment while wading in Sandy Brook, although currently this brook is largely surrounded by vegetative overgrowth and briars, making routine access unlikely. Due to the shallow nature of the brook, wading rather than swimming was assumed. Based on USEPA's request, Woodard & Curran quantified human health risks for the youth trespasser wading in Sandy Brook, ages 11-15 years, undergoing dermal contact with and incidental ingestion of surface water and sediment. Incidental ingestion of surface water was conservatively assumed to occur while wading, although it is much more likely to occur during swimming, when the receptor's head is submerged. In general, the exposure parameters used in this risk characterization reflect those recommended by USEPA (1989, 1999, 2004, 2008) risk assessment guidance. Refer to Tables 5 and 6 for the specific exposure assumptions used for the youth trespasser.

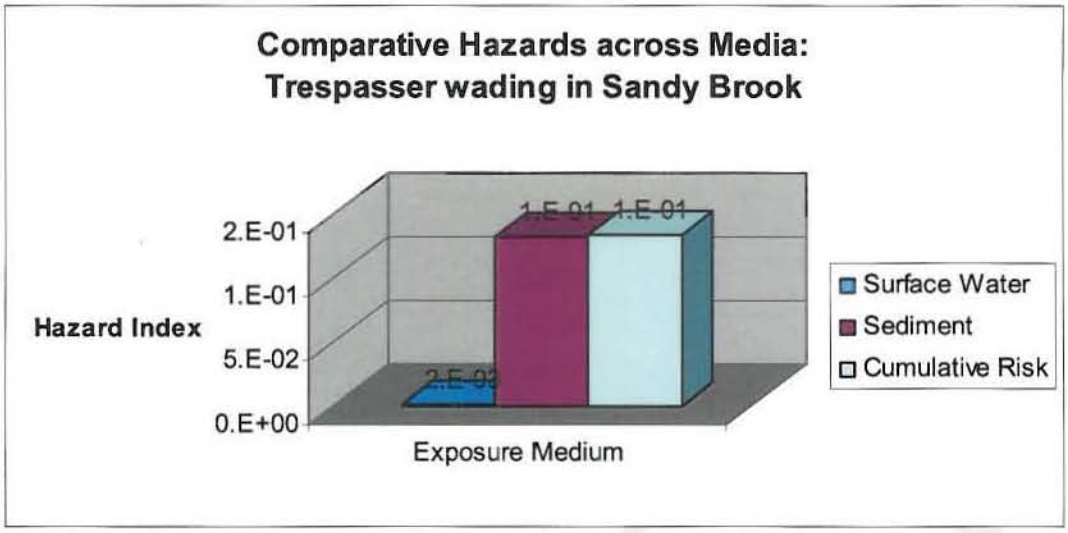
To streamline the risk assessment and to create a robust data set, multiple rounds of surface water and sediment data collected from 2006 through 2009 at the same sampling location were treated as individual data points for each medium. This is considered appropriate due to the possible temporal variability of the data. The 95% upper confidence limit (UCL) was calculated for each COPC using USEPA ProUCL software version 4.00.04. The 95% UCL for each sediment and surface water COPC was used as the EPC to evaluate the trespasser scenario with two exceptions, as noted on Table 7. Specifically, for thallium in sediment and vanadium in surface water, the maximum detected value was used in lieu of the 95% UCL due to low frequency of detection. The ProUCL outputs for surface water and sediment COPC are provided in Appendix 1.

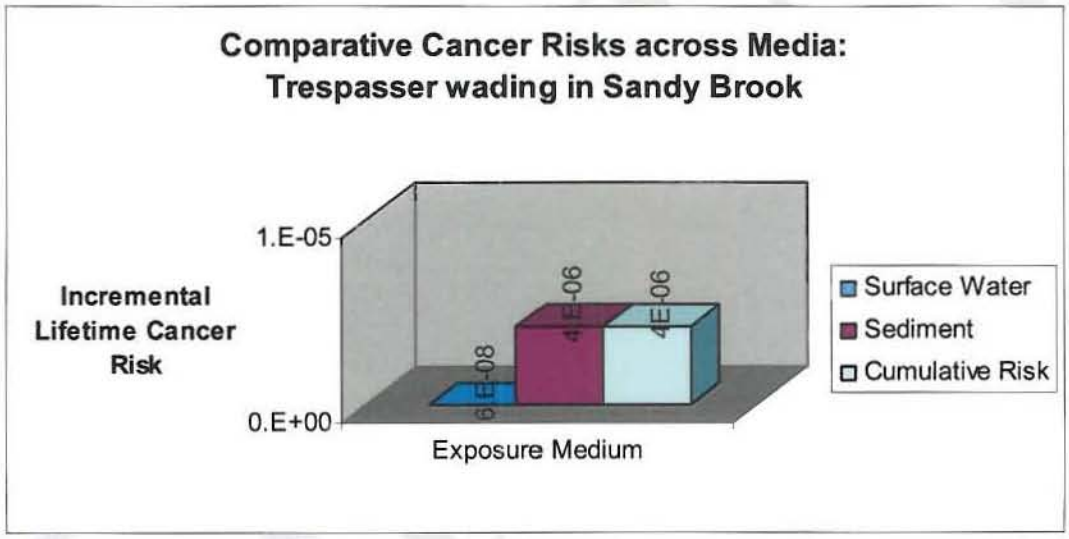
Dose-Response Assessment

The dose-response assessment describes the relationship between the level of exposure and the likelihood and severity of an adverse effect. Simply speaking, the dose-response information describes the toxicity of the substance. The products of the dose-response assessment are the toxicity values used to predict the likelihood of adverse health effects in identified receptors at site-specific exposure levels. Non-cancer oral reference dose (RfD) and oral cancer slope factor (CSF) toxicity endpoints were evaluated. Sources for the toxicity values include USEPA's Integrated Risk Information System (IRIS; USEPA, 2010), USEPA Provisional Peer Reviewed Toxicity Values (PPRTVs), and USEPA Health Effects Assessment Summary Tables (HEAST; USEPA, 1997). Dermal absorbed dose calculations, dermal absorption fractions, and average daily dose calculations are presented on Tables 5 and 6. Toxicity information is provided on Table 8.

Risk Characterization

The risk characterization combines information from the previous three steps to describe the type (e.g., non-cancer or cancer) and magnitude of risks to exposed populations. The resulting risks are compared to the risk management criteria promulgated in the regulations. The quantifications of chemical non-cancer hazards and cancer risks are presented on Tables 9 and 10. Non-cancer and cancer risk estimates are summarized in Table 11 and graphical representations of the risk characterization results are provided below. The estimated non-cancer risk for the youth trespasser is 0.1, below the respective USEPA risk management criterion of 1. The estimated cancer risk is 4×10^{-6}, within the USEPA risk management range of 1×10^{-4} to 1×10^{-6}. As shown on the summary graphs, the use of Sandy Brook for wading by the trespasser receptor poses No Significant Risk (NSR). The greatest driver of risk is dermal contact with arsenic in sediment.





Uncertainty

The data sets used in this risk assessment are considered to be of good spatial and temporal quality, and therefore representative of the exposure point, and of robust size for calculation of representative EPCs. Conservative exposure frequency and ingestion rate assumptions were made such as assuming relatively routine access to the brook, which is unlikely due to the overgrown nature of the surrounding environment. Additionally, although ingestion of surface water and sediment while wading was assumed in the risk assessment to occur at quantities comparable to swimming, is unlikely due to the shallow nature of the brook.

Furthermore, as a conservative measure, Woodard & Curran included cobalt and vanadium as two additional COPCs although their maximum detected concentrations did not exceed their RSLs. Although risks associated with dermal exposure to sediment for manganese, thallium, and vanadium could not be quantitatively calculated due to the lack of dermal absorption fraction values, these compounds are considered to be much less toxic than arsenic and therefore would not contribute significantly to the risk results. In addition, chronic toxicity values were used for the subchronic 5 year exposure duration, which is

an additional conservative measure. Woodard & Curran considers these conservative approaches likely to overestimate rather than underestimate the non-cancer hazards and cancer risk results.

References

Woodard & Curran, 2010. 2009 Annual Long-Term Monitoring and Second Five-Year Review Report, Saco Municipal Landfill Superfund Site, June 2010.

USEPA, 2010. United States Environmental Protection Agency (USEPA) Integrated Risk Information System (IRIS), www.epa.gov/iris, accessed July 2010.

USEPA, 2010. USEPA Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, www.epa.gov/region9/superfund/prg/index.html, updated May 2010.

USEPA, 2009. USEPA National Primary Drinking Water Regulations, Maximum Contaminant Levels (MCLs), EPA 816-F-09-0004, May 2009.

USEPA, 2008. USEPA Child-Specific Exposure Factors Handbook, EPA/600/R-06/096F, September 2008.

USEPA, 2004. USEPA, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final, EPA/540/R/99/005, July 2004.

USEPA, 1999. USEPA Exposure Factors Handbook EPA/600/C-99/001, February 1999.

USEPA, 1997. USEPA. Office of Solid Waste and Emergency Response, Health Effects Assessment Summary Tables FY'97 Update, EPA/540-F-97-036, July, 1997.

USEPA, 1989. USEPA Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual. (EPA/540/1-89/002).

USEPA Office of Research and Development/National Center for Environmental Assessment/SuperfundHealth Risk Technical Support Center (STSC) Provisional Peer Reviewed Toxicity Values for Superfund (PPRTVs) Database.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1 NEW ENGLAND
ONE CONGRESS STREET, SUITE 1100
BOSTON, MA 02114-2023

Memorandum

Date: August 5, 2010

From: Cornell Rosiu, Environmental Scientist
OSRR/ Enforcement and Technical Support Section

To: Leslie McVickar, EPA Remedial Project Manager
OSRR/ ME, VT and CT Superfund Section

Subj: Protectiveness of the Environment Statement
Saco Municipal Landfill Superfund Site, Saco, Maine dated September 2010.

Thank you for requesting a protectiveness of the environment memo and review of the subject draft five year review (FYR) report, supporting data and documents. The only exposure pathway for ecological receptors remains the discharge of ground water from Area 4 of the landfill to the surface water and sediment of Sandy Brook down gradient of Area 4.

The FYR adequately addresses protectiveness of the environment regarding surface water but not sediment. Concentrations of sediment arsenic at SD-34 in June 2008 were measured in excess of 106 mg/kg arsenic which is the interim cleanup level cited in the 2000 Record of Decision (USEPA 2000). Therefore, in the memo below and revised electronic FYR document emailed to you today, I provide corrections and technical content which adequately addresses environmental protectiveness of the remedy.

Please contact me at 617-918-345 if you have any questions.

Protectiveness statement summary—

Following a technical analysis of the outstanding sediment arsenic data at the site, it is concluded that the ROD is protective of ecological receptors in the short and long-term. While sediment arsenic levels do exceed the interim cleanup level in sediment of 106 mg/kg in 2008, the remedy remains protective because:

- Sediment arsenic trends are downward since approximately 2004.
- Sediment arsenic does not appear to have migrated further downstream than previously measured.
- Iron oxides in sediment increase proportional to arsenic which has a protective toxicological affect.

It is recommended that future sampling and analysis of surface water and sediment be done for arsenic at the locations previously sampled so as to determine whether or not arsenic is migrating downstream away from the seep in Area 4 of the Landfill.

Introduction and assumptions—

The technical analysis focuses on the site sediment chemical data from five locations downstream of the seep in Area 4 of the Landfill. Sandy Brook surface water flows past SD-37, SD-34 and then SD-31 at the confluence with Big Ledge Brook. SD- 69 and SD-103 occur after the brooks confluence.

It is assumed the risk-based 106 mg/kg arsenic "interim cleanup level" for sediment in USEPA (2000) is fully protective of even sensitive ecological receptors. The technical analysis below illustrates that arsenic in excess of the level is unlikely to pose a risk to ecological receptors because iron oxides in sediment increase proportional to arsenic which has a profound antagonistic affect on bioavailability and toxicity.

Technical Assessment—

Sediment sample locations leading away from the Area 4 landfill seep downstream in Sandy Brook are SD-37, SD-34, SD-31, SD-69 and SD-103 furthest away. During the Remedial Investigation/Feasibility Study (RI/FS) it was determined that contamination had progressed downstream to SD-31 but no further. Based on the observation, it was further decided that long term monitoring should be done to determine whether that condition changes in the future or not. It was considered that if monitoring showed a migration of contamination to SD-31 or beyond, then it would raise a red flag to the possibility the ROD was not protective of the environment.

In the present technical assessment, all sediment arsenic data (2001-2009) in **Figures 3-1 and 3-2** were plotted, as was more the recent sediment arsenic data (2005-2009) in **Figure 3-3**. Prior to 2004, concentrations of sediment arsenic were highest at SD-31 and SD-37 (Figure 3-1). Between 2004 and 2005 concentrations diminished at all stations except SD-69. From 2006 onward, sediment arsenic diminished further with the exception of a spurious measurement of 207 mg/kg arsenic in June 2008 at SD-34. Overall, there has been a decreasing trend in sediment arsenic downstream of the Area 4 Landfill seep both in the long and short term.

Moreover, when the ratio of arsenic to iron in sediment is plotted both long term (Figure 3-2) and recently (Figure 3-3), a consistent pattern emerges: if arsenic concentrations increase in sediment there is nearly an exact proportional increase in the iron concentration also. This is likely caused by formation of insoluble iron oxide complexes with arsenate. Formation of insoluble complexes with iron and manganese causes arsenic to become significantly less bioavailable, less toxic, and much less capable of migrating downstream in surface water.

Q: Is the ROD functioning as intended by the decision documents? *Yes, for these reasons the technical assessment indicates the ROD is protective of the environment in both the short and long-term.*

Q: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the ROD selection still valid? *Yes, except ecological risk may have over-estimated in the ROD because the formation of insoluble complexes with iron and manganese in the sediment significantly lessens the bioavailable, toxicity, and fate and transport of arsenic.*

Q: Has any other information come to light that could call into question the protectiveness of the ROD? *No.*

References—

U.S. Environmental Protection Agency (USEPA). 2000. *Record of Decision, Saco Municipal Landfill*

Superfund Site. September 29, 2000.

Figures—

Figure 3-1
2001-2009 Sediment Arsenic Concentration Trend
Saco Municipal Landfill 2010 Five Year Review

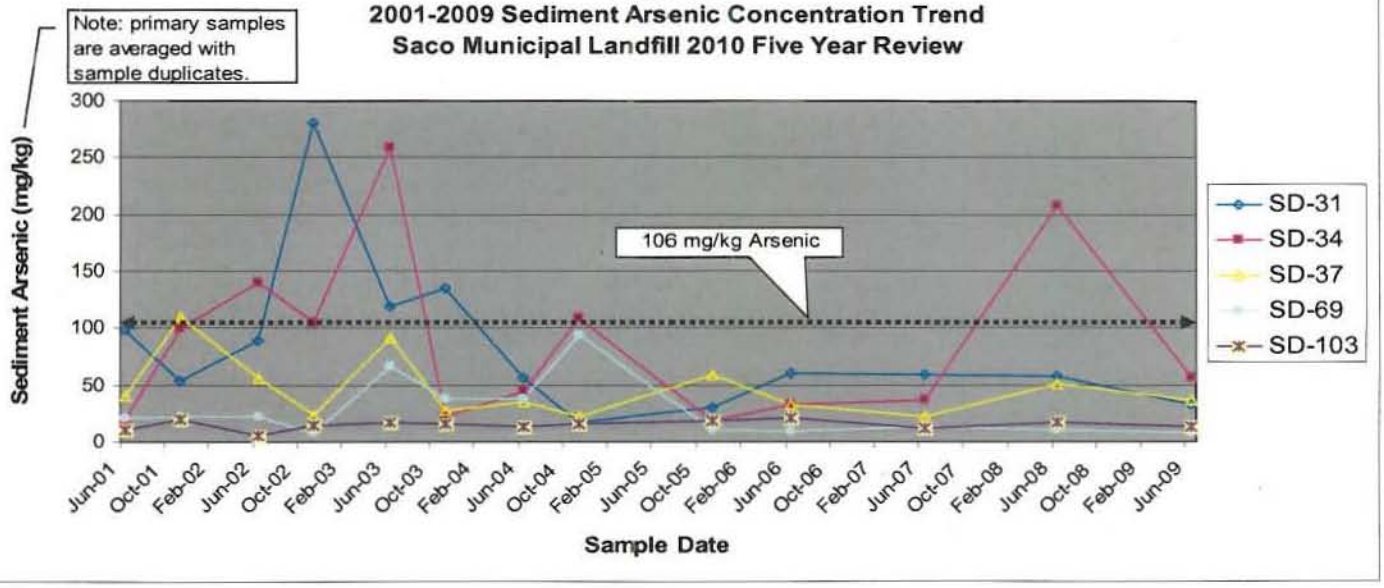
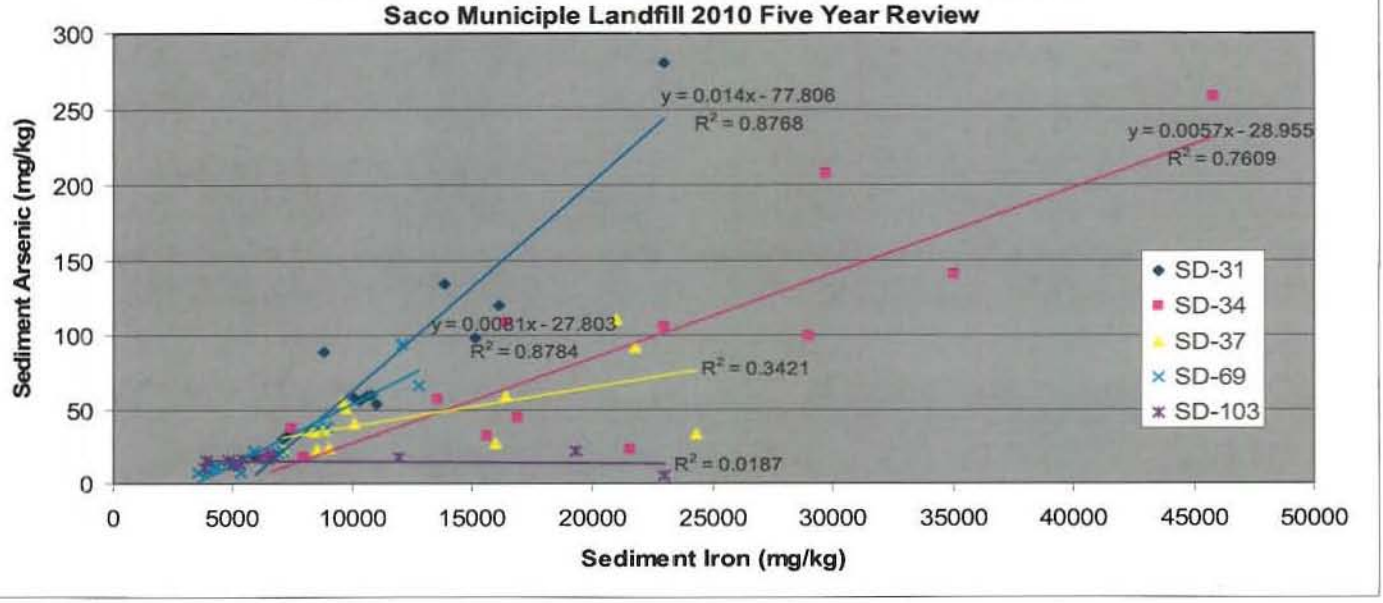
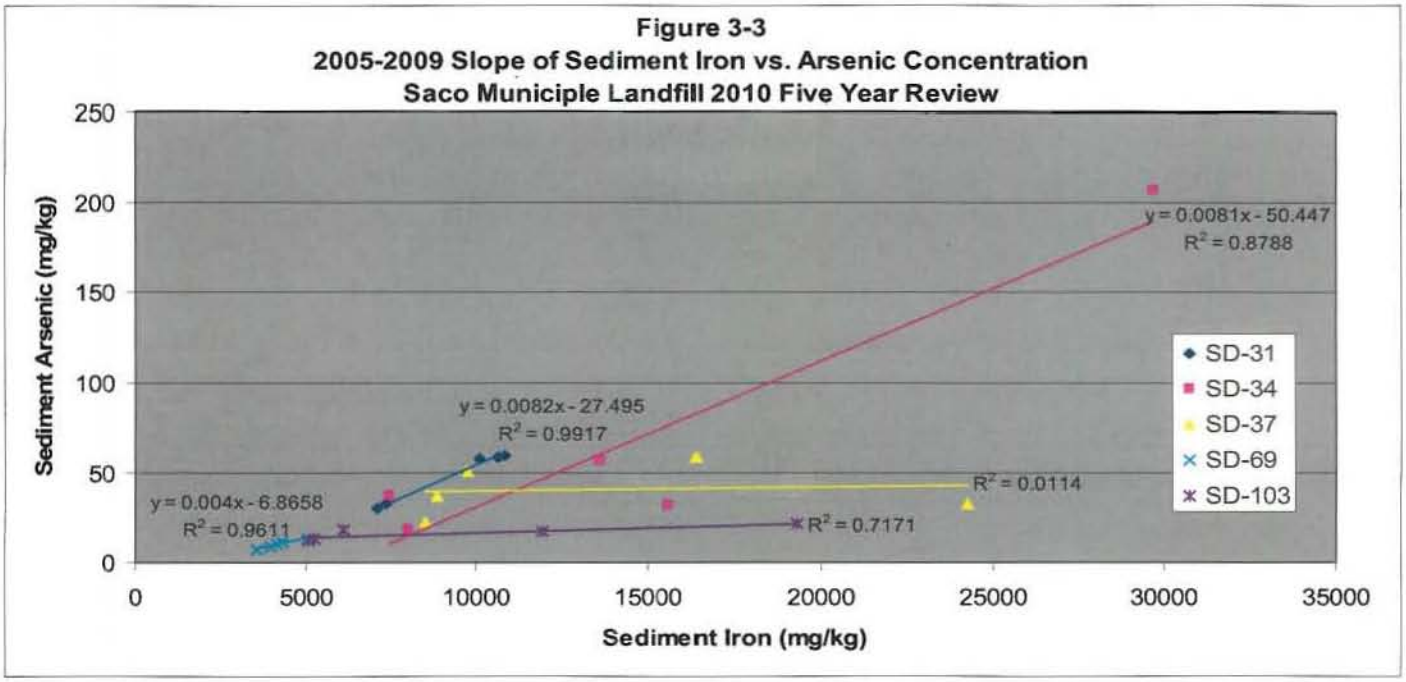


Figure 3-2
2001-2009 Slope of Sediment Iron vs. Arsenic Concentration
Saco Municiple Landfill 2010 Five Year Review





If you have any questions, please contact me at 617-918-1345.

Yours truly,

Cornell J. Rosiu
enclosure